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The Report of the Committee on the Chantrey Trust.

THE Chantrey Trust Committee have issued their Report with commendable punctuality, and the Report itself is characterised by an equally commendable brevity, precision, and moderation of language.

In regard to the quality of the works already purchased under the Trust, the Report refers to the evidence of various witnesses to the effect that "while containing some fine works of art, the collection is lacking in variety and interest, and while failing to give expression to much of the finest artistic feeling of its period, it includes not a few works of minor importance." The Report continues—"Full consideration of the evidence has led the Committee to regard this view as approximately correct. The collection, in their opinion, contains too many pictures of a purely popular character, and too few which reach the degree of distinction evidently aimed at by Sir Francis Chantrey." It is in the latter sentence especially that the true state of the case has been hit. It is hardly correct to say that the collection is wanting in "variety"; there is quite as much variety, in regard to class of subject at all events, as could be reasonably expected. But it is perfectly true that a considerable number of the pictures belong to what may be classified as "popular" pictures; the kind of works which please the ordinary exhibition crowd, and are reproduced in the popular illustrated papers. It is amusing to notice in the evidence that the painter of one of these popular pictures—a pretty but conventional *genre* work which has no claim to be in such a collection, declared (according to the report in the *Times*) that the Chantrey pictures formed "the best collection of modern art of its size that existed"; an optimistic estimate in which we fear he will not find many supporters; although, as we have said on a previous occasion, the sweeping condemnation of some of the critics on the subject is equally exaggerated. The collection includes some really fine works, amid a good deal of mediocrity.

Both the Report and the evidence* seem to show a curious uncertainty and difference of opinion as to Chantrey's object in the bequest, which appears to us to be perfectly clear from its very terms. He wished to encourage British art and to stimulate the production of the highest class of work, by providing artists with a fair chance of purchase for works of the highest class, which would be out of the run of popular estimation or comprehension. The works purchased were to be preserved as a collection, no doubt; but the formation of a Gallery was only a secondary object; the primary object was to stimulate and promote the highest class of artistic production. We cannot understand how any clear-headed person could read the terms of the bequest without recognising this as its object. The suggestion in the Report (clause 12), that "a greater flexibility of method" in finding and selecting pictures might be attained, among other means, "by purchase from private owners, or even occasionally at auction from dealers," appears to us to be quite at variance with the terms and intentions of the bequest, which aimed at the direct and immediate reward of the artist himself, and not at paying a dealer's commission; and it is much to be regretted that such a suggestion should have been allowed to stand in the Report: it is directly subversive of Chantrey's obvious intentions. There is another recommendation in the Report for which more may be said, but which we think very doubtful; that is (clause 17), that "some modification should be effected in the provision of the will which forbids the purchase of incomplete works of sculpture." What is really intended by this is that the Trust should be empowered to give commissions for the execution in a monumental material of works in plaster or terra-cotta which showed exceptional excellence. The word "incomplete" is ill-chosen to express the meaning, for it is obvious that the work, before it could be approved and commissioned, must be complete in modelling, although in a perishable material. It is quite true that the requirement of the execution of a work in marble or bronze, before it can be purchased by the Trust, puts a heavy burden on the sculptor who has to go to the expense of these materials on the chance or hope of being selected;

* The evidence has not yet been officially published, but it was reported pretty fully, and we have no doubt in the main correctly, in the *Times*.

but it should be remembered that Chantrey was himself a sculptor, and therefore knew all about a sculptor's difficulties; that he may have specially intended to promote or encourage the execution of sculpture in monumental materials; and, moreover, that he emphasised in his will the fact that considerations of benevolence or of helping struggling artists were to be taken into no account whatever in the administrarion of the Trust. This recommendation therefore we consider to be a contravention of Chantrey's intentions in an important matter, and we must regret that it has been made.

Apart from these points, everyone (outside the Royal Academy) will probably agree with the conclusion of the Committee that "too exclusive a preference has been given to pictures shown at the annual Exhibition of the Royal Academy," and also that "any purchases of works by deceased artists should only be made in exceptional circumstances, and with great caution." We have some doubt whether they should be made at all, considering that the manifest object of the bequest was to encourage good art among living artists, and not to form a gallery of the works of deceased artists; but at all events we are glad that it is discouraged.

The main and important conclusion of the Report is to the effect that the constitution of the purchasing body, as appointed by the testator, is inherently defective; that a committee of ten artists, actively engaged in the practice of their art*, cannot give the requisite time or attention to the search for the particular three or four works of art which it is possible to purchase in any given year. We fancy that this has really been a good deal at the root of the system of purchase from the walls of the Academy; the largest annual collection of paintings and sculpture is there to their hands, and selection from that source saves time and trouble. The proposal of the Special Committee is that a Selection Committee of three be appointed, to consist of the President of the Royal Academy *ex officio*, of a Royal Academician appointed by the Council, and of an Associate appointed by the body of Associates; the members to hold office for five years, and not to be immediately eligible for re-election. It is very likely that this smaller body will be able to give better and more systematic attention to the subject than the more numerous one originally constituted; but the real advantage of the inquiry lies in the fact that it has formalised the conclusion that the public, or that portion of it which takes a serious interest in art, is decidedly dissatisfied with the way in which the Trust has hitherto been administered; and that is a fact which, when thus emphasised, cannot be without influence on its administration in the future.

NEW HALL, WALLSEND.—The Victoria Memorial Parish Hall, which has been erected in connexion with St. Peter's Parish Church, Wallsend, was recently opened. The premises have been erected from the plans of Mr. B. F. Simpson, architect, at a cost of 2,400*l.*

* The words of the Report are, "in the exercise of their Profession," which is not a happy expression. Art is not a "Profession."

NEW IRRIGATION PROJECTS FOR EGYPT AND THE SOUDAN.

MAKING no pause in their efforts, the rulers of Egypt continue the execution of works for the more complete utilisation of the water already furnished by the Nile and the consideration of means for the more complete engineering control of that great river. The national reservoir at Assouan, the regulating weirs at Assiout, Cairo, Zifta, and similar works on the great irrigation canals stand prominently forth as evidence of what has been accomplished.

Equally important, though less noticeable to the casual observer, are the construction and improvement of canal and drainage systems, the conversion of lands from basin to perennial irrigation, and the reclamation of large areas in different parts of the country. We need not refer further to the important constructional works here indicated, or to the inestimable administrative services of the Irrigation Department. These have been fully discussed in previous articles, and our intention now is to consider the future requirements of Egypt and the Soudan.

For the present no monumental works are required, with the solitary exception of adequate provision in Egypt proper for the escape of surplus waters during years of unusually high flood. Thanks to the magnificent work done in the past, Egypt is reasonably assured against agricultural disaster, but much remains to be done before the full benefits of the recently-completed works at Assouan and Assiout can be experienced.

Money has still to be provided for converting the lands of Middle Egypt from basin to perennial irrigation. Fully 600,000*l.* is being spent yearly upon new irrigation works for the more efficient distribution and utilisation of the existing water supplies, and at least 1,000,000*l.* will have to be spent in a similar manner during future years before the full benefit of the works at Assouan and Assiout can be attained.

Hence it is abundantly evident that progress is by no means at a standstill. Nevertheless, the demand for cultivated land is becoming more and more pronounced, and, as the increase of the cultivated area is necessarily attended with a corresponding increase of revenue, the Egyptian Government has very wisely taken steps to ascertain the means by which may best be obtained the further water supplies necessary for rendering additional areas of land available for the purpose of agriculture.

Comparatively little has been heard of the measures in question, which are now brought prominently to the notice of the public by the recent Report* of the Under-Secretary of State for Public Works in Egypt. With the exception of a brief despatch by Lord Cromer, the voluminous Blue-book published last week is devoted to a description of the investigations undertaken by Sir William Garstin. The Report embodies the results of observations made during five consecutive years on the Upper Nile, and presents some general conclusions regarding future schemes in connexion with the improvement of the White Nile, together with an account by Mr. C. Dupuis, of the Egyptian Irrigation Department, relative to his expedition to Lake Tsana and the rivers of the Eastern Soudan.

* Despatch from His Majesty's Agent and Consul-General at Cairo, including a Report by Sir William Garstin, G.C.M.G., Under-Secretary of State for Public Works in Egypt upon the Basin of the Upper Nile. Egypt, No. 2 (1904). London: Eyre and Spottiswoode.

In a previous Report, made in 1901, on irrigation projects for the Upper Nile, Sir William Garstin made no definite proposals, but merely indicated the direction which might advantageously be taken by further inquiries. Since that year he has made an extended tour in the district of the Upper Nile, with the result that much valuable information has been acquired as to the respective discharges of the river throughout the year. The present volume, as the author says, is in no sense of the word intended to be a record of travel. It is a purely technical report written for the purpose of presenting information regarding the Nile basin in a convenient form, and with the object of assisting the comprehension of the various problems connected with the hydrography of the river.

Nevertheless, a large part of the Report is descriptive, and includes voluminous notes upon the lake area at the head of the White Nile, on the great lakes themselves, and on the various channels of the river Nile. This part of Sir William Garstin's work is full of the greatest interest, and is an invaluable record of facts which must inevitably form the basis of all future schemes for the further utilisation of the Nile.

Considering the gigantic nature of the task undertaken, it is by no means surprising that many points still require elucidation, and that more complete information is essential before accurate data will become available for the definite guidance of the engineers who will ultimately have to deal with the stupendous problem of controlling the Nile from its sources to the sea. At the same time we find in the Report sufficient indication as to the general conditions which have to be taken into account, and ample evidence that the author has fully appreciated the correct method of dealing with the work lying before the Egyptian Government.

Very considerable are the difficulties connected with exploration in the immense regions through which the Nile passes. Little more than five years has elapsed since the Upper Nile valley was reopened to travellers. The clearance of "sudd" in the Bahr-el-Gebel, although commenced, has not been entirely completed, and, as a matter of fact, it was not possible to send expeditions to the sources of the Blue and the White Niles until the end of the year 1902.

Moreover, it must be remembered that, until the Nile reservoir works were completed, the Government was scarcely justified in embarking upon other extensive irrigation schemes such as those which are now under examination.

Now that the Assouan reservoir and other works in Egypt are in operation, Sir William Garstin feels himself free to suggest fresh projects for the improvement of the Nile supply, based upon the experience gained and observations made during recent years. He also makes proposals for the formation of a regularly organised Irrigation Service in the Soudan, so that the study of the river

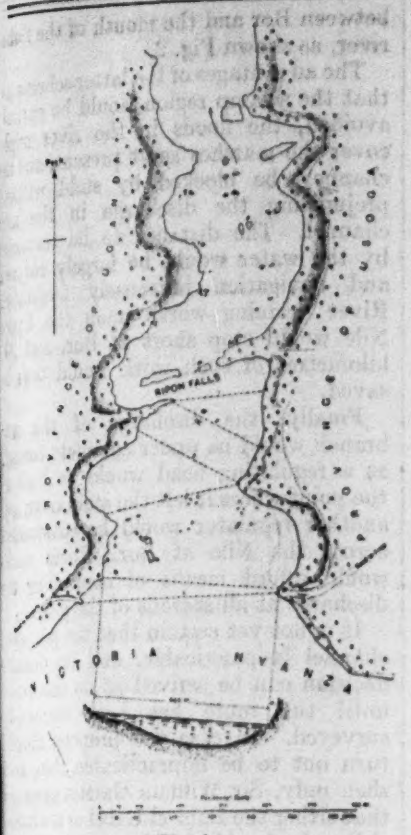

Fig. 1.

may be continued and the different projects be presented to the Government of Egypt in a complete and well-considered form. The problems to be investigated, as Sir William Garstin states, "have two main objects—namely, that of increasing the water supply of Egypt in the summer and that of securing similar advantages to the Soudan during the same period." Although both ends are of equal importance, the former is certainly more likely to be immediately remunerative.

From the information contained in the present Report, it appears probable that the most satisfactory way of securing the desired results would be to reserve the waters of the Blue Nile for the improvement of the regions bordering that river, and to utilise the waters of the White Nile for the supply of the areas of the Nile valley lying to the north of Khartoum. In discussing such projects, Sir William Garstin first deals with those in connexion with the White Nile. These are (1) the regulation of the great lakes, and (2) the prevention of the waste of water caused by the vast swamps through which the river passes in the upper portion of its course.

By reference to the plan and cross section in Fig. 1, it will be seen that there should be no great engineering difficulties in connexion with the construction of works for controlling the flow of water issuing from Lake Victoria Nyanza. In that portion of the Report descriptive of the outlet, it is stated that "the rock is a hard and compact diorite, and appears to be sound and suitable for such a work. The river could be turned through one of the openings, while the masonry in the others was in progress. When this portion of the work was completed the river could be passed through the sluices and the remaining opening similarly closed. To lower the reef would be rather more difficult, as it would not be so easy to manage the diversion of the stream, and a considerable amount of blasting would be necessary in the channel below to ensure a clear outfall for the water. Still, even to this proceeding there would be no insuperable difficulties."

The construction of a regulator at the Ripon Falls would be a comparatively easy task, for the soundness of the rock and the width of the channel would permit the construction of foundations without any serious trouble. In his recent work on "The Nile Reservoir Dam at Assouan and After," Sir William Willcocks suggests that the best method of dealing with the Ripon Falls would be by cutting down the sill, building a suitable weir capable of holding 10 ft. of water, and drawing upon the immense amount of water annually stored in the lake. This suggestion, we are pleased to observe, meets with the entire approval of Sir William Garstin, who considers that, "should regulation of the Victoria Lake outfall ever be undertaken, the necessary works should be carried out upon these lines."

This huge natural reservoir would undoubtedly afford, even after deducting loss due to evaporation, more than sufficient water to meet the wants both of Egypt and the Soudan, and it is stated in the present Report that the necessary regulating works "would in all probability be far easier to construct than was either the dam at Assouan or the barrage at Assiout."

Turning now to Lake Albert, it is clear from information available that it would be perfectly easy to build a weir at the northern outlet. Sir William Garstin says that as the rock is at some distance below the bed of the river, the foundations of the work would have to descend to a considerable depth, but the chief difficulties to be contended with are those due to the remoteness of the locality and the absence of labour and supplies.

Thus the regulation of the two great equatorial lakes presents no insuperable difficulty, nor would the works involved be of any great size. They would, in fact, be regulating weirs of ordinary dimensions and not larger than many which have been built during recent years in Egypt.

In connexion with the utilisation of these two lakes, it should be remarked that as the Victoria Nile discharges its waters into the Albert Nyanza, this lake undoubtedly forms a great regulating reservoir. The two discharges of the Nile measured in March, 1903, one above its junction with Lake Albert and the other below the outfall, seem to prove that when the river and the lake are low, and their levels not far above the minimum, there is a very inappreciable increase in the volume escaping from the lake over that which enters if from the Victoria Nile.

It is stated, on the authority of Felkin, that in the dry season less water is brought into Lake Albert from the Victoria Nyanza, and the level of the lake sinks until the rainy season sets in and the usual current of water is brought in by the Victoria Nile. What the relations may be between the incoming and outgoing discharges during the rainy season the present Report does not suggest, and until a gauge has been erected on the lake, and results have been accumulated for some years, all theories on the subject must be purely speculative. The fact remains, however, that the construction of regulating works at the outfalls of the two lakes would permit the storage and discharge of all the water required for the future needs of Egypt and the Soudan.

The great objection to any scheme for augmenting the discharge from the equatorial lakes is, as Sir William Garstin points out, that under present conditions the increased volume of water would never reach the White Nile, but would be entirely wasted in the marshes through which the Bahr-el-Gebel passes. This brings us to the second scheme in connexion with the control of the river.

The truth of this statement is made abundantly evident by the section of the report dealing with the discharge of that part of the river. The Bahr-el-Gebel, which extends from Lake Albert to Lake No, is 1,156 kilometres in length. It is shown that between Mongalla and Bor, in a distance of 133 kilometres only, the river loses 50 per cent. of its volume before entering the "Sudd" region at all. The reason for this evidently is that the flood water, instead of flowing forward, spreads out in all directions over marshes and lagoons, filling up a huge basin or natural reservoir in the river valley between Lado and Ghaba Shambé. Thus an enormous quantity of the water coming from the south is used up and never finds its way to the north at all, the effect upon the river being similar to that produced by filling the irrigation basins in Upper Egypt. The natural reservoir to which we now refer plays an important part in securing the constancy of supply in the Bahr-el-Gebel.

As the river falls much of the water stored must slowly return to the channel, although a large proportion of it is undoubtedly lost by evaporation. Still, enough remains to assist to no inconsiderable extent in keeping up the supply during the winter months.

The next point for consideration is the loss of water in the enormous marshes traversed by the Bahr-el-Gebel. These marshes commence at about 766 kilometres from Lake Albert, and continue without a break to the junction of the Bahr-el-Gebel with the White Nile at Lake No. The following table, compiled from data given in the Report, gives the discharges observed in the "Sudd" region during 1902 and 1903 :—

DISCHARGE OF THE NILE IN THE "SUDD" REGION.

Distance from Lake Albert in kilometers.	Year.	Month.	Discharge in Meters Cube per second.
400 (Lado)	1902	September	1,079
400 "	1903	"	1,085
820	1903	"	532
820	1902	"	398
947	1903	April	331
943	1903	September	375
941	1903	"	420
1,003	1902	"	333
1,146	1903	April	285
1,147	1903	August	318
1,147	1903	September	315

Examination of the foregoing table will show that in 1902, which was a year of low flood, the river lost 64 per cent. of its volume in a distance of 420 kilometres from Lado, while in 1903, a year of very high flood, the loss in the same distance amounted to no less than 73 per cent. of the discharge passing Lado. Equally serious are the losses observable

at the other points along the course of the river, and it may be asserted that in summer, when the river is low, nearly 60 per cent. of the volume passing Lado is lost by the time Lake No is reached. Again, the loss in a high flood is considerably greater than after a low one, for the flood discharges of 1902 and 1903 show a loss of water equal to 69 per cent. and 85 per cent. respectively. It should be noted that at Hellet-en-Nuer, 941 kilometres below Lake Albert, the discharge of the river is nearly constant at all seasons and under all conditions, while at the mouth of the Bahr-el-Gebel the discharge is even steadier, the volume entering the White Nile only varying between 280 and 320 cubic metres per second. These observations afford convincing proof of the enormous loss of water caused in the marshes, and that the swamps have a powerful regulating effect upon the supply at all seasons of the year. The latter characteristic Sir William Garstin justly considers to be the real cause of the constancy of the White Nile supply throughout the winter and summer months.

We are now brought to the conclusion that until means have been provided whereby the water passing Lado during the dry season can be brought down to Khartoum without serious loss it would be worse than useless to attempt the regulation of Lakes Victoria and Albert. Moreover, such regulation can scarcely be deemed necessary until the existing supply in the Bahr-el-Gebel shall have been fully utilised, and until still further supplies shall be found necessary for the requirements of Egypt and the Soudan.

One of the most interesting points in the present Report is that relating to the improvement of the Bahr-el-Gebel, so as to prevent the enormous waste of water annually taking place by evaporation in the marshes. The solution of this problem is not so easy as might appear at first sight. Although it is of the greatest importance to drain and embank the river so that the entire summer discharge may pass with practically undiminished volume, it is extremely undesirable that the same result should be attained in the case of the flood waters, which, in consequence of the holding-back effect of the Blue Nile flood, would cause disastrous flooding in the White Nile and Bahr-el-Gebel marshes. Therefore, the object should be to alter the existing flood conditions of the rivers as little as possible, and, while securing the full summer discharge, to allow surplus waters to waste and evaporate upstream as at present. In other words, the object of any river engineering works in the region affected must be to prevent the existing loss of water during the dry season of the year while preserving the regulating power of the marshes for the flood waters.

It is now recognised that it would have been a mistake, as proposed in 1901, to embank the river between Bor and Lake No so as to confine its waters to a single channel at all seasons of the year.

Sir William Garstin now says that "these swamps constitute a natural flood escape for the waters of the Upper Nile, and it is most desirable that they should continue to do so." It is shown in the Report that the loss of water in summer is chiefly due to the separation of the stream into different channels, and the flow of water through them to large lagoons, and to numerous spills through the low banks into the adjoining marshes. By closing the branches during the dry season the main cause of loss would be removed.

One simple method of closure proposed is to drive parallel lines of stakes and wattles across the head of each channel, filling the intervening space with earth. Much of the earth would be removed during the flood, and the banks could be made up again yearly after the flood had subsided, the stakes remaining in position. Another plan involves the construction of small regulators of concrete-steel at the head of each branch channel, and the proposal made by Sir William Willcocks in 1899 was to close the channels by planting in them rows of willows or similar trees.

By some one of these methods Sir William Garstin states that, without very heavy expenditure, the Nile south of the Bahr-el-Zaraf outlet could be confined in summer to a single channel, and without preventing the filling of the great natural reservoir between Lado and Ghaba Shambé during flood time.

The next point he considers is how the summer water may best be passed through the great marshes north of Bor and delivered into the channel of the White Nile without serious loss. One plan would be to select either the Bahr-el-Gebel, or the Bahr-el-Zaraf, and to remodel its channel so as to render it capable of passing a discharge of 600 to 700 cubic metres per second. Another method is to cut an entirely new channel between Bor and the mouth of the Sobat river, as shown Fig. 2.

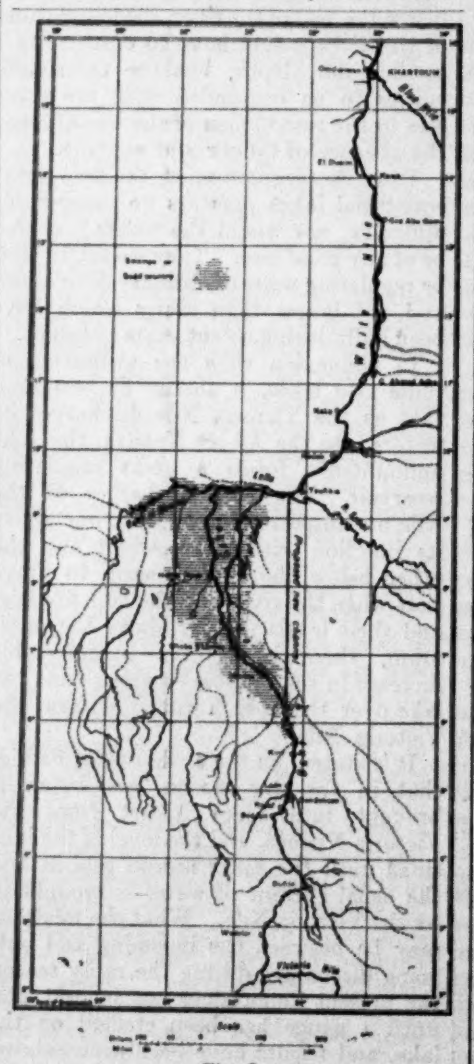

Fig. 2.

The advantages of the latter scheme are that the swamp region would be entirely avoided, the floods in the river might cover the marshes as at present, and the channels be blocked by sudd without prejudicing the discharge in the new channel. The distance to be traversed by the water would be largely reduced and navigation immensely facilitated. River training works upon the Upper Nile would stop short at Bor, and 200 kilometres of such work would thus be saved.

Finally, the discharge of the new branch would be under complete control, as a regulating head would be built at the point where it left the main river, and another regulator would be constructed across the Nile at Bor. These works would afford means of controlling the discharge at all seasons of the year.

It is not yet certain that the proposed channel is practicable, and no definite decision can be arrived at on this point until the route has been accurately surveyed. In case the proposal should turn out to be impracticable, then, and then only, Sir William Garstin proposes that either the Bahr-el-Gebel or the Bahr-el-Zaraf should be improved for the purpose of bringing down adequate supplies of water to the White Nile. Assuming the completion of a suitable channel for the summer water, the schemes for regulating the outlets of the Victoria and Albert Lakes could be put in hand, without further delay, for the purpose of securing a constant discharge of at least 1,000 cubic metres per second during the season of lowest supply.

For the purpose of forming the new channel from Bor, or of improving one of the two great channels of the Nile, the assistance of hydraulic dredgers or excavators of high power, specially designed to meet the exigencies of the case, would certainly be necessary. The conditions of labour would be difficult, as the local tribes can scarcely be counted upon for assistance. All supplies would have to be furnished from Khartoum, which is more than 950 kilometres from the nearest point of the work. The provision of fuel for the dredgers and steamers would occasion some difficulty; malaria is at all seasons prevalent in the marshes; and for three or four months in every year the rainfall is so heavy that continuous work would be impossible.

Nevertheless, the advantages that would accrue to Egypt and to the Soudan north of Khartoum, if an increased discharge of 600 or 700 cubic metres of water per second could be added at a time when water is most required, are so great as to justify the attempt to secure them at almost any cost.

It cannot be predicted precisely how much of this extra quantity of water would actually reach Assouan, but, allowing for a loss of as much as one-third, the remainder would form a most important addition to the summer supply of Egypt, and one thoroughly justifying the expenditure involved.

We have now dealt in outline with the great projects foreshadowed in connexion with the White Nile. One of these, namely, the provision of an improved channel through the "Sudd" region, is a

work that should be undertaken as soon as the preliminary investigations can be completed. The other project, involving the control of the Equatorial lakes in the manner long since proposed by Sir William Willcocks, can afford to wait, and must necessarily wait, until the Bahr-el-Gebel has been improved, so as to permit the establishment of an augmented discharge.

Next, we must briefly refer to the most interesting and able Report of Mr. Dupuis upon Lake Tsana and the rivers of the Eastern Soudan. This portion of the Blue-book will amply repay perusal, and we much regret that space will not permit us to discuss it at any length. The obvious beginning and fountain-head of all schemes for the improvement of the Blue Nile would be the utilisation of Lake Tsana, were it not for political considerations. If this natural reservoir, with an available capacity of 3,000 million cubic metres, were not situated outside the Soudan, the construction of a regulator at the outlet of the Blue Nile would at once settle the question of further summer supplies for the river. Sir William Garstin says, however, that "the questions involved by its position are so many and so difficult of adjustment that the abandonment of the project for an indefinite future appears to be a matter of certainty."

Hence the study of alternative projects has necessarily to be taken up. The following are the schemes requiring investigation in the order of their importance as stated in the Report:—

(1) The selection of a site for an open barrage near Wad Medani and the study of projects for main irrigation canals east and west of the river. (2) The possible construction of a dam at the head of the Rosaires Rapids to supplement the winter supply of the Blue Nile. The reservoir would be filled during October and November and emptied during the months of December, January, and February. (3) The improvement of the irrigation of the river Gash by the construction of a large circular basin near the apex of the delta of the river, for the distribution of the flood waters into canals through head regulators in the banks of the basin. (4) The construction of a dam and storage reservoir on the Atbara river. (5) Examination of the rivers Dinder and Kahad, with the object of deciding whether the construction of storage reservoirs would be practicable; and (6) Examination of the upper valley of the Atbara, with a similar object.

Of the projects mentioned in connexion with the Eastern Soudan, the most important are those for the control of the river Gash and the construction of the barrage on the Blue Nile. The first of these is strongly recommended, as it does not involve any considerable expenditure, and would render fully 100,000 acres of land available for cultivation by the population already settled in the district. The second would be more costly and less remunerative, although its realisation must be attempted sooner or later.

It is satisfactory to learn that the study of all the problems for the development of irrigation in the Soudan is to be taken up by a regularly organised Department, under the direction of Sir William Garstin.

The Soudan at present represents an unknown quantity, but there is every reason for believing that its return to prosperity may be looked upon as a certainty, even if the work of development be somewhat slow. Brief and inadequate as the present review undoubtedly is, enough has been said to convey some idea of the momentous conceptions contained in the Report. The rescue of the Nile from the marshes, which take from it half its volume, the control of the giant headwaters of the river, and the regulation of the Blue Nile for the regeneration of the Soudan, are some of the tasks now seriously proposed. But even these do not exhaust the category of works set forth by Sir William Garstin, and we must defer to a succeeding article the further consideration of the monumental programme he has placed before the world.

NOTES.

The Late Mr. Justice Wright and Law of Light. THE premature death of Mr. Justice Wright, admittedly one of the ablest judges, is noticeable from the point of view of the Law of Light and Air. He may be said to be the real destroyer of the doctrine of the right of the owner of a dominant tenement to an extraordinary amount of light. In Warren *v.* Brown he gave a remarkable judgment exploding the doctrine. This decision was reversed by the Court of Appeal. But when the case of the Home and Colonial Stores *v.* Colls came before the House of Lords on the same subject the Lord Chancellor directly and admittedly adopted the reasoning of Mr. Justice Wright in Warren *v.* Brown, and so the great appellate decision in Colls' case is in many ways based actually on Mr. Justice Wright's previous judgment, which certainly threw so much light on the subject as largely to lead to the final declaration of the law.

The Building of Elementary Schools. THERE appears to be no doubt, from what transpired during the debates last week on the Education question, that many local authorities are dealing too easily with the managers of the Church schools in regard to the buildings. These buildings should have been handed over to the authorities in complete repair; on the contrary, they have in many cases been taken as they stand. There also seems to be some doubt if the sanitary arrangements of the elementary schools are being kept up to the mark, and assertions were made during the same debate that county authorities were inclined to overlook these defects. Nothing can be more important for the public health than that elementary school buildings should be kept up to a high standard, since children are massed in them at an age when they are susceptible to contagious diseases. That within ten years there will be few non-provided elementary schools left seems probable, but, as long as this class of schools exists, they should be kept up to the mark both in structure and in sanitation.

Architecture in Uganda. THE advent of British rule is bringing many changes to countries that a few years ago were scarcely marked on the maps then available. In Uganda railways are by no means the only evidence of constructional science, for the capital of that country now possesses a permanent and well-built cathedral, designed by the architect-missionary, who has instructed the inhabitants in brickmaking, carpentry, and other mechanical arts. The new cathedral is the first really noteworthy public building erected in the country. The walls and two rows of columns are of sun-baked bricks, while the foundations are of bricks burnt in a kiln. It would be scarcely correct to regard the roof as a permanent structure, for it is merely covered with thatching of long grass. But the reed-work forming the ceiling is described as being a remarkably fine piece of work, and the palm-stems serving as beams and rafters also appear to possess considerable interest. The building, which is capable of accommodating a congregation of 3,500 persons, includes three aisles and transepts, meeting below a central dome, a well-appointed chancel, and the usual adjuncts of a cathedral. In the consecration of the cathedral by Bishop Tucker, assisted by fifty European and native clergy, we find striking testimony to the advances being made in a country that has only been rescued from savagery within quite recent times.

The Processional Road, Charing Cross. THE extension of the Mall, as a processional road, through Spring-gardens into Charing Cross, involves the demolition, already begun, of some remaining buildings in Spring-gardens, and of the two houses at Charing Cross near Drummonds' banking-house. The latter mark the site of the Bull's Head tavern and of the next-door house where, at one Thomson's, Milton lodged for a while, as is mentioned in his "Life" by Philips. A drawn plan made in the interval 1734-48, and formerly belonging to the Westminster Bridge Commissioners, plots the sites we mention together with "Cromwell's Palace"—where is now the bank, and the "French Church" and the "Chapel" in "Spring Garden." The Chapel stands at the north-east corner of New-street in the line of the new road, and was originally founded by some French Huguenot refugees, *temp.* William III., on the west side of the passage—now a road—leading out of Cockspur-street into Spring-gardens. Having been consumed, with the adjoining Thatched House tavern, by a fire in 1726, it was rebuilt in 1731-2 by the Honourable Edward Southwell. The French church was subsequently replaced with the chapel erected at the corner of New-street as a chapel-of-ease to the parish church of St. Martin-in-the-Fields, and dedicated to St. Matthew. Some apprehension is felt that the statue of King Charles I. will also be removed from its time-honoured position upon the site of the Queen Eleanor Cross at Charing. It has remained there during a long period, and many changes have been made around it; we may, indeed, apply to it Pope's couplet:—

"I see, I see where two fair cities bend,
The ample bow, a new Whitehall ascend."

At the remoter end of the processional road the stone piers, lamp-standards, and railings of the fore-court of Buckingham Palace are being removed

for an enlargement of the enclosure, and for a reconstruction of the railings with their middle length in one straight line instead of in a series of stepped curves, and with two chief gateways, for one of which is being made a copy of the gates which formerly stood in the "Secretary's gateway."

James II.'s Statue, St. James's Park.

REPLYING to Mr. Pierpoint in the House of Commons last week, Lord Balcarres stated that the First Commissioner of Works does not intend to correct the inscription which has been cut in the renewed pedestal, as being probably contemporaneous with the statue. But is that so? The "Autobiography of Sir John Bramston," first printed for the Camden Society in 1845, contains an entry:—

"On New Yeares Day Jan. 1686-7 a statue in brass was to be seen (placed the day before) in the yard at Whitehall made by Gibbons, at the charge of Toby Rustick [Tobias Rustat] of the present King, James the 2nd."

In his "New View of London," 1708, Hatton quotes the inscription (saying it is nearly worn out) thus:—"JACOBUS SECUNDUS DEI GRATIA ANGLIÆ, SCOTIÆ, FRANCIÆ, & HIBERNIÆ REX. FIDEI DEFENSOR, MDCLXXXVI." The later mistake of "JACOBI," for "JACOBUS," was rectified some years ago, but somehow the mistake of "GRATIÆ," for "GRATIÀ," has crept in, whilst "ANNO" was inserted before the date. In the Soane Museum is a picture (1782) of the Privy Garden, by Wheatley and Mortimer, showing the statue in its original position before the east front of the Banqueting House, Whitehall, with a railing around it. In June, 1896, the bronze was cleaned, and then painted with a very thin solution of a chemical product invented by Professor Church for preserving the patina, and a large hole in a shoulder of the figure, decayed by rain-water, was stopped up. Fourteen months afterwards the statue was removed into the garden of Gwydyr House, Whitehall, where it remained until the erection of a stand for the Coronation procession of 1902.

"The Sewage Problem Solved."

THIS is the title of a paper read by Mr. W. D. Scott-Moncrieff at the annual meeting of the Incorporated Association of Municipal and County Engineers. No one can say that the title is lacking in boldness, but the sewage problem has been solved so often (in theory) that we turn to a new claim of solution with some fear that it may be as unwarranted as its precursors. Mr. Scott-Moncrieff is, however, so careful a student of the problem that his views are worthy of thorough consideration. In his recent paper he gives the results of experiments made in filtering sewage, the principal novelty being the control of the air supply. The filter was 6 ft. deep, and the tests showed that nearly the whole of the purification was effected in the upper 3 ft., whether the air supply was at the rate of eight or sixteen gallons of air per gallon of sewage per hour; in some cases an appreciable increase of purification was effected in the fourth foot of depth, but below this the filter was for practical purposes useless. Somewhat curiously, the test without any air-supply gave approximately the same results as the other tests, but as the filter was only in operation for twelve hours per day, the periods of rest afforded a fair amount of aeration. We need scarcely say that the filter was of the percolating or trickling type, and not a contact-bed. The tests were made at Staines with sewage pumped directly from the sewer through a strainer, and, although they were not exhaustive, they were sufficient to show the advantages of Mr. Scott-Moncrieff's apparatus for determining the best conditions for the purification of a given sewage, including the rate of flow, the depth of filter, and the quantity of air required.

Sewage Filtration.

IT is now generally conceded that percolating filters give better results than contact-beds, but the difficulty of securing uniform distribution of the sewage over the filters has to some extent detracted from the utility of this method of purification. A new type of distributor has recently been tested on a large scale at Hanley, and the results are so satisfactory that it will soon be adopted for the whole of the sewage of that town. The peculiarity is that the distributor is driven by power, and the speed can, therefore, be regulated to give that rate of flow which is found to be the best for any given conditions. The experiments were made by Dr. George Reid and Mr. J. E. Willcox, A.M.Inst.C.E., and the results were given by them in short papers read at the recent Congress of the Sanitary Institute in Glasgow. Two filters were constructed, one circular and the other rectangular, each having an area of a quarter of an acre. The distributor for the circular filter was designed by Mr. Scott-Moncrieff and the other by Mr. Willcox. In each case the degree of purification effected by treatment in an open septic tank and subsequent filtration at the rate of 200 gallons per square yard for the circular filter, and from 100 to 230 for the other, varied from 91 to 97 per cent. The filters were 4 ft. 6 in. deep, and were divided into sections containing material (crushed "saggars") of different sizes; the best results were obtained with the smallest pieces, namely, 3-16 in. to ¼ in. The experiments certainly show that power-driven distributors are worthy of an extended trial. If the cost of installation and the working expenses are not excessive, they will probably be the means by which the principal objection to the filtration of sewage is overcome.

Electrical Engineering Standards.

WE have received from the Engineering Standards Committee an interim Report with reference to British Standards for Electrical Machinery. We are asked, in view of the "very great importance" of these recommendations, to give them as much publicity as possible. The Sub-Committee on Generators, Motors, and Transformers, who have drawn up the Report, mention that they have decided to confine themselves to such points as would ensure uniformity in "nomenclature, outputs, and test conditions." Some of the recommendations as to pressures and frequencies have already been published, and the others seem to have been adopted by finding out the pressures most commonly employed in this country. It may be worth mentioning that the standard pressures, for alternating current transformer work, which are recommended are 115, 230, and 460. It seems to us curious that these numbers are chosen instead of 110, 220, and 440, which are the numbers given for alternating current work. Before consulting engineers can adopt these recommendations they will certainly want to know why these numbers are adopted. Again, under the heading of "Alternating Current Generators," we read that they must "give an E. M. F. curve, which, under all working conditions, shall be as nearly as possible a sine wave." We should very much like to know what were the reasons that induced the committee to arrive at this recommendation. Did they introduce it so as to avoid possible dangers from resonance, or with the idea that alternators would work better "in parallel" when they gave sine waves? They may possibly have thought that transformers and arc lamps would work better with sine waves. As a matter of fact, however, it is a physical impossibility to make an alternator that will give anything approaching a sine wave under "working conditions." Are manufacturers to understand that the pole-pieces of the field magnets must now be twisted so as to avoid the harmonics caused by the slots in the armature? We fail to see what good is being done by the committee publishing recommendations like the one given above, without stating the object which is to be gained by following the recommendation. The Committee hint that they will probably relax the stringency of the usual conditions regarding the rise of temperature in motor coils. It is stated that the recommendations are likely to be "more liberal" than those laid down by the American or German Electrical Standardisation Committees. We suppose, therefore, that the consumer in the future may be able to get a cheaper machine. Whether this is an advantage or not depends on the durability and efficiency of machines which heat excessively.

The Port of Liverpool.

IN the early part of the present month the Mersey Dock and Harbour Board had under consideration an important scheme recommended by the Works Committee, involving an expenditure of 222,000*l.*, for the extension of the Brunswick Dock over the site of the Union Dock and the Brunswick Graving Docks, the formation of a channel 100 ft. wide from the Toxteth Dock, and the erection of two sheds, one 1,800 ft. long by 150 ft. wide and the other about 500 ft. long. These important works were authorised last week, and, when completed, will constitute a very valuable addition to the facilities of the port. At the same time, we may mention that a large graving dock is now under construction on the Mersey, in pursuance of the Act of 1903. The steel gates of this dock, 135 ft. wide, are of special interest, being wider than any hitherto constructed. Huge quantities of sand have been removed from the river during the past year, no less than 2,995,500 tons having been raised and conveyed out to sea by the sand pump dredger *Coronation* since September, 1903. From the bar and shoals in the

Queen's and Crosby channels 7,923,300 tons of sand were dredged during the past year. Some idea of the herculean task imposed on the engineering staff may be gathered from the statement that, since the commencement of dredging in 1890, the total quantity of sand removed from the river is approximately 80 million tons.

The Plummer Tower, Newcastle-on-Tyne.

FROM recent correspondence in the *Times*, it appears that negotiations of some kind are in progress which may involve the sale and consequent demolition of the Plummer Tower on the ancient city wall of Newcastle. Very little now remains of the ancient fortifications of the city, and it is almost impossible to believe that the inhabitants would permit the destruction of so valuable a relic as that which is now threatened. There is evidently some mystery about the matter. On one hand, Canon Rawnsley refers to the common belief that the tower is doomed and to contemplated action by the local society of antiquaries, and, on the other, Mr. Lambert—who was born in the tower and is a trustee of the Incorporated Company of Masons, to whom it belongs—merely states that he and other members have not consented to the sale. This is a dark saying, and, coupled with the statement that Mr. Lambert does not base his refusal on antiquarian grounds, seems to justify apprehension. We sincerely trust that public attention will not be diverted from this threatened piece of vandalism.

A Note on the Chantrey Evidence.

THERE are two points in the evidence (as reported) given before the Special Committee on the administration of the Chantrey Fund, on which we would say a word. In the first place, what is the meaning of the strange opinion expressed by the President of the Royal Academy, at the close of the evidence, that "French influence had tended to debase art, and had induced young men to take no trouble to learn anything at all"? Does this include French landscape-painting? Does it apply to such painters as M. Gervais, or such sculptors as MM. Mercié, Jean and Alfred Boucher, Gustave Michel, and others who might be named? As a comment on Impressionism it might be just; but French art is not all Impressionism. Another point is—how is it that among the names of artists who have been passed over, which have been repeated more than once in the evidence and in articles written on the subject, we hear nothing said of Mr. Arthur Hughes, one of the most gifted of the group who used to be called præ-Raphaelites, and whose pictures have been on the line at the Academy over and over again? He is a far more important artist than Frederick Sandys, whose name has been brought forward; and we can recall some of his pictures—his beautiful triptych, "Viola d'Amore" for instance (a work quite beyond popular appreciation), which would have been better worth purchase than some score or so, at all events, of the paintings in the Chantrey Fund collection. The new Selection Committee, when constituted, might as well consider whether they cannot in this respect do at least tardy justice to a gifted painter who has been unduly neglected.

THE ARCHITECTURAL ASSOCIATION. EXCURSION.

FOR the thirty-fifth annual excursion of the Architectural Association, the committee have chosen the south-eastern corner of Somersetshire and the borders of Dorsetshire, with the old-world town of Sherborne as a centre. Here, in accordance with the usual custom, the majority of the excursionists took up their quarters, at the Digby Hotel, on Saturday. The President of the Association (Mr. Guy Dawber) took the chair at dinner, and a pleasant opportunity was afforded of meeting old friends and reviving reminiscences of former happy tours. Although this is the fifth occasion on which the Association have visited Somersetshire, the splendid list of attractions prepared by the untiring hon. secretaries, proves that the county is by no means yet exhausted. Former centres have been at Wells, Bath, Yeovil and Taunton; and but few of the places included in this year's programme have been previously visited. It is now twenty-one years ago since Yeovil was made a centre on the occasion of a visit to these parts, and but few members could recall that occasion. Sunday was quietly spent, many of the party visiting the Abbey church. Rain fell plentifully in the early part of the afternoon, but, in spite of threatening appearances, a drive was taken in the neighbouring district of the east of Sherborne.

Village of Trent.

The official programme of the excursion commenced on Monday morning, when the two breaks and a waggonette started from headquarters, full of good-humour, sketching paraphernalia, cameras and luncheon hampers for the north and north-west. The morning appeared inclined to be wet, but, fortunately, though some sharp showers fell, they did so at convenient intervals. After a drive of a few miles the party came to the little village of Trent, and alighted at the lychgate leading to an old-world burial-ground, with its old cross in a base of circular steps.

The lordship of Trent in the days of the Norman Conquest was part of the vast possessions of Robert, Earl of Moreton. The church, which is dedicated to St. Andrew, consists of nave and chancel, a chapel on the north side, and a transept on the south, with porch and a small baptistry at the west-end of the nave. The nave and chancel are Perpendicular, but the tower is Decorated; it stands over the south transept, and is of rather fine design, terminated by a pierced, quatrefoil parapet, supported by a corbel table, with crocketed pinnacles at either angle. Rising above is a spire 35 ft. high, with moulded angles. This is one of the very few spires to be met with in Somersetshire, and it has been suggested that the idea emanated from Warwickshire, the county from whence the patrons of the church came.

On the north side of the nave is a chapel corresponding with the south transept; the eastern window, as well as a single lancet light in the western end, belongs to the Decorated period. Under the recessed arches in the north wall of this chapel are two stone effigies, one representing a man in plate armour of the period of Edward III.; attached to his girdle is a great sword on the left side, and a short dagger on the right, but it is not known whom the figure represents. There are slight traces of colouring. The other effigy is of a different character, and represents a civilian—probably a youth. The chapel is, perhaps, that of the chantry, founded by John Frank, a native of Trent and Master of the Rolls in the reign of Henry VI., and a lawyer of great repute in his day. The chantry was founded within the church, and this chapel appears to be the only part of it appropriate for the chantry altar and services. It was, however, probably used for some other purpose previous to the foundation of the chantry *temp.* Henry VI., as it appears to be of much earlier date, and is supposed to have been originally a Lady Chapel. On the suppression of chantries, the temporalities of this one, together with the mansion of the chantry of Trent, and stables and garden adjoining, was granted to William Fountayne and Richard Mayne for the sum of 6*l*. The house of the chaplain is still standing adjoining the churchyard, and has some of its original windows remaining. The chapel itself was taken possession of by the Gerard family, and the s ffite of the arch dividing it from the nave is decorated with two genealogical trees, containing nearly forty shields of arms of Thomas Gerard and Ann Coker his wife, and their respective alliances. The rood-screen is a fine specimen, consisting of three perpendicular traceried bays, the central one with doors; a fan vault carried the rood passage, the cornice being richly decorated and gilt. The ornamented cornice, instead of being of carved wood, appears to be in some parts of plaster. The pulpit is very ornately carved with Biblical subjects, and apparently had its origin in Belgium or the Low Countries. Very many of the original seat-ends remain, and are quaintly carved with heraldic devices. Some parts of the church have been restored, and there has been rather too liberal a use of cement, but still several features commanded attention, more especially the exterior and the really fine tower and spire.

The sketchers found much to interest them out-of-doors, and the water-colourists of the party worked under particularly good conditions, as by now the day had decided to be brilliant. The fine old grey spire, surrounded by foliage of sombre yew trees; the Manor House and adjoining farmyard: the ancient presbytery, with its old-world garden nestling among the elms, provided a variety of picturesque subjects. Adjoining the church is the Manor House where King Charles II. lay concealed for more than a fortnight, during which period the house was rigorously searched on more than one occasion. The hiding-place is a dark space between a ceiling and floor above, apparently constructed intentionally, with scarce room to stand upright. From here Charles made his unsuccessful attempt to escape from Lyme, under the guidance of his host from Trent, Colonel Wyndham, who, for this and other services, was rewarded with a baronetcy and a pension.

Queen Camel Church, etc.

The next place on the programme was Sandford Orcas, but this house unfortunately had to be omitted, and instead the party drove some five miles to Queen Camel, an interesting church placed almost under the shadow of Camelot, famous in Arthurian legend—

> "Like Camelot what place was ever yet renowned,
> Where, as at Carlion, he kept the table round?"

The church has many interesting features, but its principal glories are undoubtedly the four fine timber roofs over chancel, nave, and aisles. The chancel roof is of arched form, in six bays, with many quaint and unique carved bosses of a variety of biblical and heraldic subjects, in several of which animals figure prominently. The mediæval idea of a camel is especially worth noting. Angels bearing shields support the principals, and between is a boldly-carved wood cornice. The nave roof is flat. It consists of five bays supported on stone corbels, and originally appears to have been panelled, though, at some later date, rafters were substituted for the panelling, with the exception of the half of the easternmost bay, which retains its original form. The clerestory is lit by three light windows, arranged centrally over the nave arcade, which consists of octagonal piers with moulded caps and bases. The arch between nave and choir is panelled, and in this respect recalls the nave arcade of Sherborne Abbey. One of the most interesting features of the church is the very fine and lofty rood-screen, in five perpendicular bays, and richly carved cornice. The church was well restored some thirty years since by Mr. Pearson. It contains many monuments, mural and otherwise, to the St. John Mildmay family. The font is of rather an unusual type, octagonal in form, with small square angle pillars with niches containing saints.

Luncheon was partaken of in an adjoining meadow, and afterwards a start was made for Hazelgrove, the seat of Captain Mildmay. This house was not on the programme, but was substituted for Sandford Orcas, and the short time allotted to it proved only sufficient for a cursory examination. The beautiful late Renaissance carved work in the dining-room, ornate in character and executed with wonderful skill and spirit, was brought here from Dartmoor House, and admirably adapted to its new surroundings. A small and low apartment adjoining forms part of an older building, and contains a good XVIth-century plaster ceiling. It is known as Queen Elizabeth's room. The garden forms an attractive setting to the house, more especially the simple lines of kitchen garden with its intersecting yew alleys and gay borders.

North Cadbury Church.

From Hazelgrove a drive of two miles brought the party to North Cadbury, whose church, dedicated to St. Michael, was rebuilt by Elizabeth Lady Botreaux about 1415. Here the party were met by the Vicar, and an interesting paper was read upon the history of the fabric. The chancel was restored some thirty years ago, when a flat stone was discovered on the top of the wall plate, with a date, 1417, scratched upon it, and underneath it a mason's chisel. The church was formerly collegiate and in Dugdale's Monasticon is a copy of the charter granted by Henry V. It is a good specimen of the earlier Perpendicular style and consists of a tower, nave, chancel, north and south aisle, and north and south porches. Tradition says that the tower was first built and stood alone for some time. This is borne out by the appearance which the junction of the side aisles with the tower still presents. Both aisles appear to have been joined on to the tower and of later construction. There are four clustered columns on each side of the nave, and above are clerestory windows.

The wall of the south aisle encloses a portion of the string course of the tower above the clerestory windows; and in the north aisle may be seen one of the tower buttresses with the old string course. The roof of the nave, side aisles, and chancel is of oak covered with lead, and over both nave and chancel it is supported by well carved stone brackets. There is an ancient stone font at the west end of the nave. The whole building is practically of one date. The only fragment of an earlier church consists of portions of the piers and capitals of the nave arcades. One of the most striking features about the church is its excessive symmetry. There is even a two-story porch on the north side to match that on the south, and the only difference in the two elevations are due to the tower stair turret on the south side, and a vestry on the north. Mason marks abound on the outside of the church. It is probable that at some period the vestry may have been in use as a school, and two black letter alphabets can very plainly be deciphered painted upon the wall. In the church register is recorded an accident which occurred in the XVIth century when one of the heaviest bells falling from the tower completely ruined a monument standing below. The oak seating, which is dated 1538, appears to have been partly Dutch and partly English, a mixture of Gothic and Renaissance detail. Under a yew tree in the vicarage garden may be seen the fragments of an elaborate stone pulpit dating from the XVth century.

Manor House, North Cadbury.

The Manor House adjoins the churchyard on its eastern side; a short carriage drive leads to the forecourt and north front of the house, with its charming variety of outline and collection of gables, its lichen-covered walls of warm-toned masonry and stone-slated roof. On the western side is a picturesque addition, supported upon a bold arch. The plan is distinctly mediæval, and whilst its decoration clearly belongs to a later date, it is very probable that much of the walling is earlier. The north side is by far the most attractive, and this was originally approached through a square forecourt and imposing gate-house. Unfortunately this has disappeared, though the inconvenience of having to approach the house on foot across the forecourt is hardly consistent with the greater comfort demanded in the present day. The character of the house has suffered much from the rebuilding of the south front in the early years of the last century. After seeing over the Manor House, the party were hospitably entertained to tea by the Vicar, who produced interesting souvenirs of the church's history. Then, at the sound of the quartermaster's whistle, a start was made at six o'clock for the long and hilly drive home to headquarters, passing *en route* the historic hill of Camelot, whose extensive earthworks indicate the important part this fortress town played in the early history of these parts.

Tuesday.

The second day of the excursion was devoted to the district south-west of Sherborne, and at 9.30 train was taken for Crewkerne, when the brakes met the party. A drive of several miles through lanes and orchards brought the excursionists within sight of the town of Beaminster, delightfully situated in a valley, its church tower rising proudly from amongst the collection of stone roofs of the old-fashioned town which lies embosomed among surrounding hills, through which a peep may be obtained of the English Channel and Lyme Bay.

Beaminster Town and Church.

The town suffered great hardships during the Civil Wars, when an army under the command of Sir Thomas Fairfax "marched from Dorchester to Beauminster. The train and most of the foot quartered on the top of an hill; some laid in Beauminster town, a place of the pityfulest spectacle that man could behold, hardly an house left not consumed by fire, the town being fired by some of the enemy in five places at once when Prince Maurice was there, by reason of a falling-out between the French and Cornish." So record the chronicles of the day, and we are told that later on the inhabitants were successful in obtaining an ordinance of Parliament for raising 2,000*l.*, with which some part of the town was rebuilt It was, however, again destroyed by fire in 1684, involving very heavy losses. It suffered from fire yet a third time in 1781. Then in the course of three or four hours all the houses on the west side of the street leading from the church to the market place were destroyed. These disasters no doubt account for the lack of old buildings to be met with in a town where one might have expected more.

The church consists of chancel, nave, north and south aisles, with another aisle or Lady Chapel north of the chancel. The tower is of good proportions, rising nearly 100 ft. in height, with highly ornamental angle buttresses and small crocketted pinnacles rising from their several splays; an additional air of elaboration is imparted by the miniature pinnacles in the upper story rising out of grotesque corbels, and entirely detached from the wall. About 8 ft. from the ground level the tower is encircled by a band of quatrefoil and tracery. In the second story on each face are square-headed windows, each of two lights. The upper story has pointed windows, each of two lights, divided by a central pier, at the foot of which is a small pinnacle, the shaft all anglewise, rising from a corbel placed in the centre of the string which marks the stage. On the west front of the tower are three niches; the central figure represents the blessed Virgin seated, on the right hand the figure of St. James, and on the left St. George subduing the dragon. Above these is a small square-headed window, walled up, and having beneath a small sculpture of the crucifixion, with the Virgin Mary and St. John; higher up are further niches and pinnacles, with central groups representing the Resurrection and Ascension. On each side are figures in the costume of the day, one a Palmer the other a Fuller, said to represent two of the principal contributors to the building of the tower. The whole structure is of uniform Perpendicular character, dating from the latter part of the XVth century, excepting a portion which is an elongation of the south aisle; the original purpose of this part is uncertain, but it is known as the "Mort House." The nave consists of five bays; the capitals of the three westernmost are of a pleasing type, entwined with a chaplet of vine leaves and fruit. The nave has a modern roof, but the aisles still retain their original oak roofs, the plaster by which the framework was hidden having been removed in recent years, and the whole restored. These roofs are not of a very interesting type, and, from an almost entire absence of mouldings, are extremely severe and heavy. On the wall of the south aisle are two interesting monuments of marble, both belonging to the Strode family, and dated 1698 and 1746 respectively. A small stairway still remains, which formerly led to the rood-loft, which has, unfortunately, been removed.

Melplash Court.

The carriages were now taken and a short drive brought the party to Melplash Court, a typical Jacobean manor-house, with two fine old elm avenues leading to what was doubtless the forecourt of the house, which lies in a slight hollow, surrounded by its barns, farm buildings, and an ancient circular dovecote, with stone slated roof and quaint cupola, easily capable of accommodating 250 pigeons. Here the party took luncheon under the avenue, and afterwards saw the interior of the house. The large dining-hall is now used as a kitchen, and has an elaborate plaster coat of arms. The buttery screen still remains intact. The parlour contains a fine chimney-piece—removed from another part of the house—with the arms of England, France, Scotland, and Ireland, and the initials of "Jacobus Rex." Adjoining the house at the back is a small building called the chapel, probably only a domestic one, if ever thus used.

Parnham House.

The next place visited was Parnham House, where the owner very courteously conducted the party over the old Manor House, many years ago the seat of "the right antient and worshipfull familie of Strodes." Here they flourished in knight's degree, showing considerable astuteness, and much bettering their estates by a careful selection of the heiresses they took for wives. We may gather from a minute and curiously worded survey of the estate drawn up by Sir John Strode in 1628, that the mansion was rebuilt and enlarged with "Hambden Ashlar" by one Robert Strode in the reign of Henry VII. Unfortunately the alterations carried out in the early part of the XIXth century rather spoilt the character of the earlier work, but the present owner has done much to keep the original character of the building, the treasures of which provided much material for study. The hall has a Tudor screen, a fine Renaissance fireplace, and many splendid suits of armour. A small apartment on the ground floor contains a very fine specimen of a Tudor fireplace, with its massive oak cambered beam, and carved tracery panels.

Crewkerne Church.

The party then had a long drive of some eight miles northward to the town of Crewkerne, within church on a slight rise. Crewkerne Church is one of the great cross churches of the country. The west front has a fine late-decorated doorway, with niches on either side surmounted by busts. The gable of the nave is flanked with octagonal turrets embattled with vestiges of small pinnacles. As in so many churches in the county, the nave is of better work than the chancel, it is also very much loftier. On the south side is a very large porch, something similar to the south transept. A curious change was made when the porch had been converted into a transept, and the transept into a sort of porch. The windows in the nave are very wide, so that there are only three bays where there would have been probably more in a nave of that length. The extreme flatness of the transept windows is remarkable. The north transept is the most elaborate part of the church. There are indications of a vestry below the east window, but this building has been destroyed, the doorways alone remaining. At the south-east corner of the church, which formerly contained the figure of the patron saint, and indications still remain of an iron grille which protected the statue. The church contains examples of three distinct periods of Perpendicular work. To the earliest period belonged the whole of the chancel and much of the southern transept, the second period the whole of the nave, aisles, porch, and tower, together with some alterations to the south transept, the works probably extending over a considerable period during the reigns of Henry VII. and Henry VIII. The third period is shown in the north transept, together with a series of chapels between it and the chancel. In the porch is a fan vault and stoup and outside on the parapet a very interesting series of gargoyles. Those over and around the porch welcome the people with a hymn of praise, with mediæval harps, lyres, tamborines, and bagpipes. The tower has several curious features; the lower part was probably early work, though now completely cased in Perpendicular masonry; at three of the corners the buttresses stand within the church. Abutting on the churchyard is the old grammar school founded by John de Combe in 1499, it forms a very interesting feature, and in the market square is an interesting mediæval house of the XIVth or XVth century. Crewkerne was the last item on the programme for the day, and the short space of time left the party admitted of only the most cursory examination. Train was then taken to Sherborne. The day had been of great interest, and though overcast the rain did not interrupt proceedings.

Clifton Maybank Manor.

Wednesday.—The climatic conditions for the third day's work of the tour were anything but agreeable, and in consequence a change had to be made in the programme, and instead of driving to Clifton Maybank as had been originally

intended, the breaks were sent on ahead, whilst the party followed to Yeovil Junction Station by train. Clifton Maybank was probably built by Sir John Horsey, whose name and family arms, with the date 1586, are in one of the Hall windows. A great part of the former noble mansion has been pulled down, but enough is still standing to show that it was once quite an important mansion. The remaining wing was built by the Horsey family early in the reign of Henry VII. This family inherited it from the Maubanks; after some years the property passed to the Harveys. A manuscript account, dated 1648, gives the following quaint description of the house and its environs:—"The capital messuage consists of a faire yellowe freestone buildinge, partly two and partly three stories. . . . In the front of the house a square green court and a curious gatehouse with lodgings in it standinge with the front of the house to the south. . . . Without the gatehouse paled in a large square greene, in which standeth a faire chappell; of the south-east side of the greene court, towards the river, a large garden. Of the south-west side of the greene court is a large bowling greene, with lower mounted walks about it, all walled about with a batteled wall, and sett with all sorts of fruit; and out of it into the fieldes there are large walks under many tall elmes orderly planted." According to Hutchins, the gateway leading into the court is ascribed to Inigo Jones, and was erected by Sir Ralph Horsey in the reign of James I. It was taken down in 1800 and transferred to Hinton St. George, by Lord Paulet. The front of the building was purchased by Mr. Phelips, and erected against the west front of Montacute House, where it now remains. In the western gable of the now remaining wing is a fine oriel window, on which are carved the three horses' heads of the Horsey family and two roses. The terrace surrounding the bowling green and garden may still be traced.

Brympton Church and Manor House.

From Clifton Maybank a drive of about four miles took the party to the green-turfed forecourt of Brympton Manor House, with its nicely-proportioned stone balustrade wall and gate piers. The Mansion and Church of Brympton form quite a striking architectured group. A large and stately mansion, a house of humbler pretensions, and the parish church all lie close together, and all are worthy of attentive study. The church is small, and originally was of the Decorated style, without aisles or tower. The south transept has a beautiful geometrical window to the south and a foliated arch connecting it with the nave; the south door is foliated. But one Sydenham, a pious benefactor in the reign of Henry VII., founded a chantry for three priests. He built for their dwelling-place the house which still remains, on the north side of the churchyard, and at the same time modified the church to adapt it to his purpose. He made an eastern addition to the north transept, and altered the appearance of the gable so as to give it the external appearance of an aisle, whilst internally there are two chapels. The rood-screen is of stone, quite an uncommon feature in a parish church, and in all pobability dates from the XIVth century. There is a quaint bell-cot, with quite a distinctive charm of its own on the western gable, and the graveyard contains several well-designed tombstones. The so-called chantry house, now used as a toolshed, is on the right-hand side of the entrance courtyard. It is an oblong perpendicular building of two stages, with an interesting and remarkable octagonal turret giving access to the upper chamber, which is very large, with a good open roof and some fine plaster ceilings of later date. On the south side of the larger room is a small doorway, which was the entrance to the garderobe. Taken as a whole, the building presents the common type of a mansion house of the XIVth or beginning of the XVth century.

After the larger mansion had been built by the Sydenhams, this old manor house appears to have fallen into neglect, but early in the XVIIth century it became necessary to make use of it again as a place of residence. This may have been on account of the alterations then being made to the larger mansion. The north-west portion of the house retains its early character, and there is a fine display of oriels, turrets, chimneys, and open battlements. The central part containing the hall has been altered in Elizabethan times, but it retains its original basement and a curious kind of oriel. The south front of the house retains its original walls, but early in the XVIIth century, when the house was brought "up to date," a classic front was added and the house was generally reconstructed. Horace Walpole is responsible for the tradition that Inigo Jones was employed on this work, but it was actually carried out by his nephew John Webb. The mullions and transomes employed in the pedimented classic windows are very unusual at this period, when the Classic styles were fully launched on this country; the refinement of detail which Jones shows at Wilton House and Coleshill, both anterior to Brympton, are certainly lacking, and the whole work much more suggests the hand of Webb than of Inigo Jones.

On the garden, or south front of the house, is a broad terrace belonging to the early part of the XVIIIth century. It has a broad central flight of steps, and at either end two smaller flights arranged at right angles. The piers support urns of different designs, with the exception of one which carries a sundial with gnomons on the sides of a square die. The porch of the house has a date 1722, when it is supposed to have been brought from Clifton Maybank, when that house was destroyed. The rooms are large and lofty, and contain some good tapestry and excellent portraits by Lely. Sir S. Ponsonby Fane very kindly entertained the party to luncheon, and in the afternoon they drove to Newton Surmaville, an Elizabethan building and seat of the old family of Harbin.*

TRAMWAYS AND LIGHT RAILWAYS ON PUBLIC ROADS.

THE following is a copy of the letter which has been received by Mr. W. Rees Jeffreys, the Honorary Secretary of the Roads Improvement Association, Down-street, Piccadilly, W., from the Board of Trade with reference to the matters connected with tramways and light railways on public roads, and bridges over railways and canals, which formed the subject of the representations made by the deputation from the Association to the Board on July 18:—

"I am directed by the Board of Trade to refer to the deputation received by Sir H. Jekyll on the 18th instant from the Council of the Roads Improvement Association, on the subject of tramways and light railways on public roads.

"The Board have carefully considered the representations then put forward with regard to the questions of centre poles, width of roads, and bridges over railways and canals, and I am to reply as follows:—

"(1) *Centre Poles.*—The Board do not see their way to recommend total prohibition of the use of centre poles, as there might be cases of exceedingly wide roads where such poles might be the best arrangement or other cases where, for some reason, centre poles might be necessary.

"The Board feel, however, the force of the objections stated by the deputation, and will be prepared to enact in Tramway and Light Railway Orders that centre poles shall not be used without the express consent of the Board of Trade. They will also communicate with the Parliamentary authorities concerned in private bill legislation as to the desirability of such a provision. In this way promoters will be required to justify the use of such poles in each case as it arises.

"(2) *Width of Roads.*—The Board do not consider that it would be advisable to fix a statutory limit that might have the effect of prohibiting by severence urgently needed lines. In dealing with applications for tramway and light railway powers, the Board always keep in view the 9 ft. 6 in. space referred to in Section 9 of the Tramways Act 1870 (a limit which would appear to be reasonable), and make provision to secure it wherever practicable. The representations made by the deputation on this point will, however, be borne in mind.

"(3) *Road Bridges over Railways and Canals.*—Most of what was urged by the deputation with regard to this matter would appear to be for the consideration of the Local Government Board and not of the Board of Trade, this department being only empowered to deal with appeals from owners of road locomotives who may feel aggrieved by restrictions placed on the use of bridges over railways by such locomotives, either by notice under the Locomotives Act 1861 or by by-law under the Locomotives Act 1878. With regard however to the request for legislation to enable a county council to require the owner of a bridge to maintain it at its original strength, I am to point out that section 65 of the Railways Clauses Consolidation Act 1845 provides a procedure under which either a road authority or any two householders in the locality interested may take steps to compel a railway company to repair their bridges."

* To be concluded in our next.

BRITISH ARCHÆOLOGICAL ASSOCIATION CONGRESS AT BATH.

THE sixty-first Annual Congress of the Association was held at Bath, from the 8th to the 13th insts., that city not having previously been visited since 1856, when the meeting was held jointly at Bridgewater, the Congress removing to Bath for the latter part of the week's proceedings.

The Congress was opened on Monday, the 8th, at 3 o'clock p.m., at the Guildhall, where the members were heartily welcomed by the Mayor, Alderman Major C. H. Simpson, J.P., M.C., and the members of the Local Executive Committee. After the President of the Association, Mr. R. E. Leader, B.A., had duly acknowledged the cordial reception extended to the members of the Congress by the Mayor and Corporation and the Local Committee, the party proceeded, under the guidance of the Mayor, to view the Guildhall and Municipal buildings.

Bath Abbey Church.

The Abbey Church was next visited, where the members were met by the Rev. H. L. Maynard, in the absence of the Rector, the Rev. Prebendary Boyd, who gave some descriptions of the building and related its history. The bases and portions of the columns of the Norman church, which are carefully preserved beneath the flooring of the present church, were examined with great interest; they, together with others just outside the east wall of the church, appear to belong to the edifice erected by Bishop Robert about 1160, the successor of John de Villula, who purchased the city of Henry I. for five hundred pounds of silver, together with the Abbey, and rebuilt the latter from the foundations. The Norman church must have been of grand proportions, if, as is said, the present church occupies the site of the Norman nave only. The existing building was commenced in 1500 by Bishop Oliver King, and is one of the latest examples of Perpendicular work in the country. Although there are, here and there, features of beauty, the general effect is that of coarseness and lack of refinement, due mainly to the largeness of the mouldings and want of delicacy in the details. The curious carvings on the west front, of angels ascending and descending ladders, representative of the vision of the Holy Trinity, which Bishop Oliver King saw in a dream one night in 1499, attracted much attention; the figures, however, although well executed are now much defaced.

President's Address.

Under the guidance of the Rev. C. W. Shickle, M.A., and Mr. Sturge Cotterell, the local hon. secretaries, visits were made to the hot mineral baths, the museum, and the Royal Literary Institute, and to some of the historical houses in the near neighbourhood. The party then returned to the Empire Hotel for dinner, and, at 8.30 p.m., attended a conversazione given by the Mayor at the Pump Room and Roman Promenade. During the evening the Mayor expressed the great pleasure it had given him to receive the members of the Association, and then called upon the President to deliver the inaugural address. After dealing with the subject of archæology generally, and contrasting the apathy and indifference displayed in the past towards the preservation of national monuments and objects of antiquity, with the attitude towards such matters at the present day, Mr. Leader went on to say—"Much irreparable mischief had been perpetrated in the last sixty years, much grievous vandalism had been rampant; but infinitely more would have had to be regretted but for the influence exerted by the British Archæological and kindred associations." "Archæological enthusiasm had been spread abroad and new investigators had been brought into the field. Antiquarian research was no longer the possession of the few. It was widespread. It had its schools, and its chairs, and its endowments at the universities. One even heard of some rudiments at least being taught in our elementary schools. There was good reason to hope that before long the University of London would grant a degree in

archæology." Referring to the visit that afternoon to the Abbey church, the President said—"He was sorry to think that even in Bath—cultured, refined, educated Bath—it had been possible to mutilate the piers of the Abbey church in order to put in iron supports for an organ of not the most beautiful construction. If such an eyesore could be found in Bath, how could they wonder at outrages being perpetrated elsewhere? The Association was successful in Sheffield last year in saving an ancient monument from possible destruction, and it would be very gratifying indeed to members of the Association if any words from the Presidential chair should help to remove from the Abbey the disfigurement he had mentioned." "Bath had been exceptional, and was still exceptional, not only for the antiquities it possessed, but for the men who had devoted a large part of their lives to the study and elucidation of its antiquities. They had almost a literature of their own relating to Bath archæology. In the *Transactions* of archæological and other societies were numerous papers and articles relating to the city and its neighbourhood, contributed by learned antiquaries, while scattered throughout English literature, in memoirs, gossiping diaries, and romances, in reminiscences and novels are pictures of the social and fashionable life of which the city was the centre. The pages of their own *Journal* were enriched by those papers contributed by Bath's learned antiquaries when the Association met here nearly fifty years ago. The only justification for his attempting to add a few crumbs to the rich repast was that some records which recently came into his hands had never been published, and though they told the students of Bath life nothing new, they were not perhaps without their value in helping them to realise the doings in the city of Bath at the time when Beau Nash had made himself the controller of its destinies, and was, he supposed, at the height of his power. The housekeepers' accounts of the Howards of Worksop Manor contained payments made in connexion with visits to Bath by Lady Mary Howard in 1732 or 1733. They showed what a costly and elaborate pilgrimage was involved when a noble family journeyed to take the waters in the fashionable city. Before starting, large provisions of gay garments had to be made—French gowns, lace, and the rest. Remembering the greater value of money at the period, very considerable expenditure was implied in such items as 91*l.* 2s. 9d. for 'linnen, lace, etc.,' 42*l.* 10s. for lace for Lady Fanny Shirley, and 15*l.* for 'linnen for Mr. Southcote.' There was paid 4*l.* 12s. 9d. for habit-making and trimmings. There were twelve horses on the road costing 6*l.* 7s. 10d. Eating on the road cost 15*l.* 9s. 8d. Servants' drink on the road 1*l.* 8s. Arrived at the destination the expenditure was on the scale of a large establishment." Mr. Leader remarked that there was a certain undesigned appropriateness in Bath being chosen for this year's Congress in succession to their visit to Sheffield last year. Utterly dissimilar as were the two cities in the part they played in the nation's life, there were certain points of contact between them of no little interest. The first book of importance printed in Sheffield was a substantial quarto on the nature of the mineral waters, written by a Sheffield physician, Dr. Thomas Short. The two cities had also a joint share in the careers of two remarkable men, John Arthur Roebuck and the Rev. James Hunter. Sheffield gave Mr. Hunter to Bath, and Bath gave Mr. Roebuck to Sheffield. Both came of Sheffield families, both married Bath ladies, and Mr. Roebuck, while paternally descended from Sheffield, was on his mother's side the great grandson of a man famous in the musical annals of Bath—Dr. Linley, one of whose beautiful daughters married Richard Brinsley Sheridan. In concluding his address, the President commended the action of the Corporation for its care in indicating by memorial tablets the residences of celebrated men and women of the past; he also expressed his appreciation of the value of the very carefully prepared historic map of Bath, by Mr. Sturge Cotterell. The company then descended to the Roman baths, which were illuminated by electricity, where Mr. Alderman Moore gave an interesting description of their discovery.

Great Chalfield Church and Manor House.

A large party set out in carriages on Tuesday for Great Chalfield, Bradford-on-Avon, Farleigh Hungerford Castle, and Hinton Charterhouse. South Wraxhall Manor House, a fine example of domestic architecture of the XVth century, was viewed from the road, time not allowing of a visit to it. On reaching Great Chalfield, the Parish Church was first visited, and was described by the Rev. C. W. Shickle, M.A., F.S.A. It consists of a nave, chancel, and side chapel, built in the XVth century, by Thomas Troponell, who obtained the manor by marriage into the Percy family. There is no tower, but a very picturesque corbelled-out bell turret and spire surmounts the western gable; it is of the decorated period. The church has been altered in many ways, and is in an unseemly condition, the walls being covered with yellow wash and the arches oak grained. The Manor House is of the XVth century, and immediately adjoins the little church, and constitutes, with the barns and farm buildings, of the time of Elizabeth, a most picturesque group of buildings, all surrounded by a water moat. In the Civil wars the house was occupied by troops. Leaving Chalfield, the drive was resumed to Bradford-on-Avon, where, after luncheon, the Parish Church was visited, the party being received by the Vicar, the Rev. S. G. Collison, M.A., who gave a description of the edifice, which is of a very interesting character. It is dedicated to the Holy Trinity, and dates from about 1100. The chancel was lengthened in the XIVth century; it was originally only two-thirds of its present length. The tower at the west end is of late XVth century date, and has a groined and vaulted lower story. There are several interesting memorials in the church. On the south side of the chancel is a mutilated effigy of a cross-legged knight under a canopy, to a member of the Hall family, and on the north side a recessed tomb and effigy of a female wearing a wimple, considered to be Agnes Hall, who died in 1270. There are traces of a rood-screen, and there is a large and long hagioscope on the north side. There is also a brass to one Thomas Horton, who was a clothier in Bradford, and is thought to have built the tower.

The Saxon Church of Bradford-on-Avon.

The Saxon Church, dedicated to St. Lawrence, founded by St. Aldhelm, Abbot of Malmesbury and the first Bishop of Sherborne, in 705-709, was next visited, and was described by Mr. Chas. S. Adye. This very remarkable building has now been completely cleared of all the encumbrances which existed when the late Canon Jones first discovered its sacred character, and we now behold an almost unaltered Saxon church of the early VIIIth century. The chancel step is still *in situ*, the arch itself of very narrow proportions, and over it are carved two large figures of angels, each wearing flowing robes and a nimbus, and probably at one time there was a crucifix between them. The exterior presents a remarkable appearance, the walls being arcaded and panelled, with arches supported on pilasters, with heads and bases of like character. From the Saxon church the party, under the guidance of Dr. Beddoe, proceeded to view the exterior of the old Hall, which is a very fine example of domestic architecture of the early XVIIth century. It was built by one of the Halls, who were wealthy clothiers in Bradford. This was the house, an exact reproduction of which was erected as the Royal Pavilion at the Paris Exhibition in 1900, as a typical example of an old English Manor House. The Tithe Barn, erected about the end of the XIVth century as a Tithe Barn for the Abbess of Shaftesbury, and the old Bridge were inspected, and the party resumed the carriages to Farleigh Hungerford Castle.

Farleigh Hungerford Castle.

Here, in the outer court, Mr. Patrick, hon. sec., read some notes on the history of the Castle, and pointed out the chief remaining features. In its original form the Castle comprised two courts, north and south, surrounded by a lofty enceinte wall. On the south and west sides there was a moat; the other sides were protected by the steepness of the ground. The principal entrance was on the south-east side, where the remains of the gateway still exist, over the arch of which is the sickle, the crest of the Hungerfords, and higher up a shield of arms, with the initials E. H. In the outer or lower court are the remains of the guard-room, stables, etc. The chapel, which is the most interesting part of the Castle, is also situated in the outer court, on the right of the entrance gateway. It is well preserved, and consists of a nave and chantry chapel on the south side. The chapel is now used as a repository of local antiquities, and contains a large quantity of soldiers armour of the XVIth and XVIIth centuries, banners, bridle-bits, stirrups, old keys, and some carved oak furniture. The walls of the eastern end retain some curious stencilled decoration, and a figure of a knight kneeling; while on one side of the altar is a delineation of St. George and the Dragon. There are several interesting monuments in the side or chantry chapel, with recumbent effigies, to various members of the Hungerford family, and in the vault beneath lie some six or seven corpses wrapped in lead; the outer wooden coffins have long since perished. At Hinton Charterhouse, the next halting place, Mr. E. T. D. Foxcroft met the party, and described the remains of the Carthusian Priory, one of the earliest of this order in England. Its probable date is considered to be 1232, as it is related that the foundress, the Lady Ela, Countess of Salisbury, founded it and the Abbey of Lacock both on the same day. From Hinton Charterhouse the party returned to Bath, which was reached about 6.30. The evening meeting was held in the drawing-room of the hotel at 8.30, and two papers were read.

Bath Stone.

The first was on "Bath Stone," by Mr. T. Sturge Cotterell, one of the local hon. secs. He said the Bath stone of which he was about to treat is quarried on the uplands south of Bath and north-west of Wilts, the quarries having been sunk on a vast oolite which American and Continental geologists call "jurassic" formation. From the time of the Romans down to the present day, thousands of tons have been extracted yearly from this bed, and the day is still far distant when it will be exhausted. The massive structures at and around the hot mineral springs, erected by the Romans two thousand years ago, are still in a state of preservation, which testifies to their wisdom in the choice of the stone and to its excellence. It was quarried to the south of the city adjoining the "Fosseway," near to what is now Bloomfield Crescent. The votive altars in the museum at Bath are made of stone from the quarries on the "Fosseway," and were probably erected in the IInd century. There were many Roman walls within the city boundary in which large blocks of the oolite stone could be found. Under the United Hospital a Roman wall exists in which there are several blocks, and on one may be seen the earliest mason's mark in Bath—viz., the letter "T." Ralph Allen and John Wood are the two most successful and conspicuous pioneers in the great industry of extracting splendid building stone from the vast oolitic deposit. Ralph Allen came to Bath in 1715. Four years afterwards he established the system of bye and cross posts, which is the foundation of our present postal system. He was a shrewd and thorough business man, and, foreseeing the enormous possibilities when a supply of valuable building stone was developed, decided to reopen the quarries on Coombe Down, and, subsequently, to develop the deposits on Hampton Down. He was ably seconded by John Wood, the architect, whose genius is seen in the streets, squares, and crescents of the city. It was chiefly due to him that the efforts of Beau Nash to make the city a resort for pleasure seekers as well as invalids were crowned with a success unique in the history of the city. In the neighbourhood of Box Hill, both below and above the famous tunnel constructed by Brunel, oolite has been extracted in large quantities as far back as Saxon times. "Hazelbury Quarre," or quarry, has been identified as the place whence the stone was taken for building the Abbey of Malmesbury 1,100 years ago, and it is interesting to note that the stone for its restoration to-day is being quarried from the same place.

Eighteenth Century Architecture of Bath.

Mr. Mowbray Green, A.R.I.B.A., next read a very interesting paper on "The XVIIIth Century Architecture of Bath," which was made more interesting to the audience by many admirable views exhibited by limelight. Mr. Green prefaced his paper by exhibiting and explaining a map of the city as it was at the close of the XVIIIth century, when it only measured about 1,200 ft. by 1,150 ft., and was surrounded by walls, of which there are traces remaining in the Upper Borough walls. In 1702 and 1703 Queen Anne and her royal

consort the Prince of Denmark, visited Bath, and the city became more widely known. The houses at that period were characterised by large windows with bolection or wave mouldings round them. Of such was the Saracen's Head, in Bond-street, with the initials, "W. D.," and the date 1713 upon it. The old mullioned windows were then giving place to the new large sash windows. In 1716 on the site of the new bowling green a row of houses was begun and called Green-street. That was one of the most picturesque parts of Bath now remaining. John Wood was born in 1704, and in 1725 became interested in Bath. His first scheme was the building of a court of houses for James Duke of Chandos. In 1727 he left London for Bath, where his workmen were busy, and in that year Chapel-court was begun. On the west side was the house in which Horace Walpole lived in 1765, and the wing to the east was St. John's Hospital, designed by Wood in 1728. Queen-square was begun in 1728 on the eastern side. The whole was finished in seven years.

Concluding his paper, Mr. Green said that generally speaking the style of the XVIIIth century in Bath might be divided into three groups—that of the first twenty-five years when the houses had gabled roofs, and facades with large sash windows surrounded by bolection mouldings, and the interiors were panelled and the rooms small and comfortable; the next fifty years when the work was modelled on the classical Palladian manner with rusticated basements, two storied orders, a cornice and parapets with Mansard or curb roofs, while the interior became spacious and dignified, and plaster work was brought into general use; and the last twenty-five years, when the free manner of Robert Adam came into vogue and the strong methods of the earlier times gave way to detailed and abundant decoration.

Wednesday, August 10.

The members of the Congress left the hotel in carriages about ten o'clock for Box, Corsham, Lacock, and Castle Combe. A brief halt was made at Box to view the church, which is early English, with features in the Decorated and Perpendicular styles, and a good perpendicular tower and spire at the intersection of nave and chancel. Leaving Box, Corsham was soon reached, passing on the way "Hazelbury Quarre," mentioned in Mr. Cotterell's paper, and the village of Pickwick—the name of Pickwick is not an uncommon one in the neighbourhood of Bath.

Corsham Church.

Arrived at Corsham the party was met at the parish church by the Rev. E. A. S. Gell, M.A., who gave a brief description, and then invited Mr. Patrick, hon. sec., to read some notes which Mr. C. H. Talbot had sent him upon the church descriptive of its appearance before the restoration in 1878. The nave arcade is Norman, and bears evidence of having been lengthened by one bay in the Norman period. The church had a central tower, removed at the restoration, when a new one was erected with a spire at the South side. The Tropenell Chapel on the north side of the chancel is of the XVth century, and has a very fine stone screen with fan vaulting under the loft; the cresting is modern. There is a piscina of good character in the south wall. The chapel contains a very fine table tomb with recumbent effigies of Thomas Tropenell and his wife Agnes, the builders of Great Chalfield Manor House. He is said to have deceased in 1490. There is also a second altar tomb to another member of the same family in the north east angle. The chancel exhibits no feature earlier than the XVth century, though some parts of the walls may be older. On the south side of the chancel there is a very fine chapel of the XVth century. It communicates with the chancel by two panelled arches. At first sight the east window and the easternmost window on the south side appear to have been blocked up, in the lower part, but they were so built, there being an ancient vestry inside lit by two small windows. This is said to have been the "Consistory," and as Corsham was formerly what is called a Peculiar, the vicar having had probate of wills, the records connected therewith were, no doubt, kept here. This room only rises to a slight height and there is a loft over it, open to the rest of the chapel and reached by a contemporary stair. This loft was, before the restoration, used as the vestry.

Lacock Abbey, etc.

Leaving Corsham the drive was continued to Lacock, where, at the church, the party was met by Mr. C. H. Talbot, M.A., who gave a description of the building, which is of the XIVth and XVth centuries, with a beautiful Lady Chapel, having vaulting and pendants of the date of about 1460. After luncheon at the Red Lion, the members proceeded to Lacock Abbey, where they were received by Mr. and Miss Talbot, who conducted them round the buildings of the monastery. Mr. Talbot described the buildings, which constitute the most perfect and unique example of a XIIIth-century monastic house remaining in England. The monastery was founded, as was remarked previously when speaking of Hinton Charterhouse, by Ela, Countess of Salisbury, on April 16, 1232, when Ela was in the forty-fifth year of her age, and the seventh of her widowhood. She founded the two monasteries in one day: Lacock, for canonesses of the Austin rule in the morning, and the Priory of Hinton in the afternoon, for Carthusians. The foundation of both monasteries, however, by charter had taken place some time previously. Eight years after the foundation the Countess took the veil and became abbess of her own establishment, which she ruled for some twenty years, when she retired, appointing Beatrice of Kent abbess in her stead on December 31, 1256. Five years later she died, aged seventy-four, and was buried in the choir of the church. At the dissolution the Abbey church was destroyed, but the cloisters, of the time of Henry VI., together with the refectory, chapter-house, sacristy, and other of the monastic buildings remain, and form a most valuable and interesting example of a conventual establishment. Leaving the monastic buildings, the party, led by Mr. Talbot, proceeded through the gardens to see the "Nuns' Cauldron," which is now raised on a pedestal. It holds about sixty-seven gallons, and bears an inscription on the outside as follows:—"I was molten or made by Peter Waghevens, of Mechlin, in the year of our Lord 1500. Praise to God and glory to Christ." Passing into the mansion house, the alterations made in the Abbey buildings to fit them for private residence by Sir W. Sharington were pointed out by Mr. Talbot. In a long stone gallery, part of Sir W. Sharington's work of adaptation, there is a very fine Renaissance chimney-piece, and here are preserved many priceless works of art. At the south-east corner of the house is an octagonal tower, also Sir W. Sharington's work, which contains three rooms, one over the other. The lower two have vaulted ceilings, that on the first floor, known as the Muniment Room, having a constructional fan vault but no fan tracery. It was originally intended to be painted, but this was never executed. In this room and the one over it are two remarkable tables of stone richly carved in the best early Renaissance style. The visitors were shown by Mr. Talbot, in the Library the Great Charter of the Abbey granted by Henry III. in 1225, once belonging to Ela, the foundress. Owing to the interest of the visit to Lacock, and time having slipped away, it was decided to abandon the proposed visit to Castlecombe and drive direct to Bath, which was reached about 6.45. At the evening meeting a paper was read by the Rev. Dr. Astley, in the absence of the author, Mr. Giberne Sieveking, upon "The Rise of the Woollen Industry."

West of England Rood-Screens.

A paper was also read on "West of England Rood-Screens," illustrated by lantern views, by Mr. F. Bligh Bond, F.R.I.B.A. Mr. Bond explained that the English Church from the earliest times had scrupulously preserved the division between nave and chancel. In the West of England, however, they found no true screen-work until the XIVth century, and of that period there was but very little extant. The reason was that in the XVth century so many churches were rebuilt, when almost all the old screen-work was swept away to make room for the work of the latter date. Amongst the many beautiful screens shown was that at Nunney Church, near Frome. A few years ago the Somerset Archæological Society visited the church, but found the screen had been removed. It was found in a furniture dealer's shop awaiting sale, but, a strong protest by the Society resulted in its restitution to the church. Most of the screens in this part of the country are of wood, very few being of stone. Some eighty or ninety views illustrated the paper.

Bitton Church.

Thursday.—Rain set in in the early morning and was falling fast when the members of the Congress set out, about 10 o'clock, in closed carriages for Bitton, Syston, Pucklechurch, and Dyrham. Fortunately on reaching Bitton about 11 o'clock the weather cleared, and the afterpart of the day was very pleasant. At Bitton the Rev. Canon E. T. Ellacombe, M.A., received the party, and gave an interesting account of the church and the Manor. At the period of the survey in 1086 the Manor belonged to a Saxon Thane named Duns, who, previously to the Conquest, held this and other manors in Stoke, Rockhampton, and Brimsfield. He was, however, obliged to give them up to William. The church of Bitton held one hide of land in the parish and a prebendal stall in Salisbury Cathedral. The church, dedicated to St. Mary, consists of a nave, chancel, and western tower, with porch and north aisle. There appear to be some remains of a pre-conquest church built into the north wall near the east end. The nave is very long and of early XIIth century date, with north and south doors of the same period. The chancel and west tower are of the XIVth century, 1370 to 1380. The Pope granted thirty days' indulgence to every one subscribing towards the building of the tower. On the north side is a chantry dedicated to St. Catherine, the consecration deed of which is dated 1299. Over the chancel arch on the east side are indications of an early rood. There are some good monuments.

Churches of Syston and Pucklechurch.

A drive of about three-quarters of an hour brought the party to Syston, where the church, dedicated to St. Anne, was visited. It is a small church with a Norman nave, an early English chancel and a western tower. The south doorway is particularly interesting and is richly carved. It is of the XIIth century, having a tympanum on which there is carved the tree of life, with mouldings of the cable, zigzag, and circle patterns. The capitals of the shafts have fluted ornament. A leaden font of transition Norman design, bearing figures of Apostles, alternately with scroll-work, beneath semi-circular arches and richly-ornamented, is a feature of great interest. Syston Court was next visited, by the kind permission of the owner, Mr. J. E. Rawlings. It is a Tudor House, said to have been built by a member of the Dennis family. It closely adjoins the church.

The drive was then resumed to Pucklechurch for luncheon, after which the Parish Church was inspected. The Rev. S. G. Gillum, M.A., gave a description of the building. Mr. Patrick, hon. sec., also read some notes on the architecture and monuments. Professor J. P. Hamelins, who attended the Congress as a delegate of the Société D'Archéologie de Bruxelles, drew some interesting comparisons between the flowing lines of the late decorated tracery of the windows and tombs in the north aisle, and the flamboyant style of the continent, and considered that French influence was exhibited in these beautiful monuments.

Dyrham Church and House.

From Pucklechurch the drive was continued to Dyrham, where, at the church, the Rector, the Rev. W. T. Blathwayt, M.A., received the members, and his son, the Rev. W. E. Blathwayt, read a short paper on its history. Dyrham is celebrated in English history for the great battle fought there in 577, by Ceawlin and Cuthwine, in which they completely defeated the Britons and captured Gloucester, Cirencester, and Bath. The church is dedicated to St. Peter, and was erected in the XIIIth century, but was largely added to during the XIVth century. Later a chantry chapel was added for a Guild, founded in 1520 by Sir William Dennis and his wife Anne. There is a life-size splendid brass on the floor of the chapel to the memory of Sir Morys Russell and his wife Isabel; it is a well-known example. The pulpit is a good example of Jacobean work, and has an elaborate sounding-board. From the church the party proceeded to Dyrham Park, the mansion closely adjoining the church. The house is of two dates, Tudor and late XVIth century. It was the home of the Dennises, but was much enlarged by William Blathwayt, who was Secretary of State to William III. It was completed in 1698. The house contains a fine collection of paintings, mostly of the old Dutch school, Dutch picture-books, and old Delft pottery.

Leaving Dyrham about 5.45, Bath was reached about 7 o'clock.

The Saxon Church at Bradford-on-Avon.

After dinner the evening meeting was held in the drawing-room, when the Rev. Dr. A. J. D. Astley read a paper upon "The Saxon Church at Bradford-on-Avon." As the members had spent considerable time in the examination of the building on Tuesday, Dr. Astley omitted the actual description of the church, and confined himself to dealing with the controversial question whether the present building is the original Saxon Church of the VIIIth century, or whether it is a restoration of that building dating from 950 to 1000. He was in favour of the latter theory, and Mr. Wigfull, of Sheffield, was inclined to the same opinion. Dr. Birch, however, was emphatically of the contrary opinion. Mr. Patrick also was disposed to agree with the earlier theory, but disclaimed any special study of the subject.

Friday, August 12.

This morning the members of the Congress had to make an early start, leaving Bath from the Midland Station at 8.55, for Glastonbury and Wells. Arriving at the former place, after nearly two hours' travelling, they proceeded, under the guidance of the Rev. Prebendary Grant, M.A., to inspect the ruins of the famous Abbey, the Abbot's kitchen, the Abbey Barn, and the celebrated Museum.

Glastonbury Abbey.

At the Abbey, Prebendary Grant gave a history of the foundation of the Benedictine Monastery, and of the earlier buildings which occupied the site of the beautiful Lady Chapel, and described the meaning of the carvings on the north and south porches. Mr. Patrick, hon. sec., then described the plan, and pointed out the architectural features of the remains of the Abbey, and explained the construction of the western Galilee in the XIIIth century, by which the Lady Chapel, which originally was quite an isolated building, occupying the site upon which the earliest wicker church was erected, was united to the Abbey church, the latter being approached by a broad flight of steps from the lower level of the Lady Chapel. Glastonbury Abbey is so well known, and has been illustrated in the "*Builder*, Abbey Series," that further description is unnecessary here. A visit was subsequently paid to the well-appointed Museum, where the relics discovered in the lake village were fully described by Prebendary Grant. After luncheon, carriages were taken for Wells, and the Cathedral, Bishop's Palace, Vicar's Close, etc., were visited. Indisposition unfortunately prevented the Rev. Canon Church from meeting the members and describing the Cathedral, as had been hoped for and arranged, to the great regret of the meeting. A smart drive had to be made to Masbury Station to catch the 5.8 train to Bath. In the evening, at 8.30, the Rev. C. W. Shickle, M.A., F.S.A., the President of the Bath Natural History and Antiquarian Field Club, gave a reception at the Art Gallery in honour of the Association, which was largely attended. In the course of the evening Mr. Shickle read a paper dealing with the "City Chamberlain's Accounts." He had gone very thoroughly into the investigation of the ancient documents, consisting of over 100 rolls, some of which were very difficult to decipher. They related to almost everything which could be thought of in connexion with the city, and covered the period from 1569 to 1725—a long and important period of English history. Mr. Shickle quoted numerous extracts from the accounts, many very curious, and mentioned that he intended to send a copy to the British Museum. Mr. Sydenham also read a paper on the "Hot Springs of Bath." In the library were exhibited by the Town Clerk some of the more interesting and valuable of the City Charters, which were described and commented upon by Dr. W. de Gray Birch, F.S.A., Hon. Treasurer of the Association.

Saturday, August 13.

It was intended to have completed the week's programme by a morning drive to some of the antiquities in the suburbs of Bath to-day, but, as so many members were leaving for London and other places, the excursion was abandoned, and the closing meeting was held in the drawing-room of the hotel, when votes of thanks to the Mayor and Corporation and the local hon. secs., and those who had assisted to make the Congress successful, were passed with acclamation, and the meeting separated.

Illustrations.

ST. GEORGES DE BOSCHERVILLE.

ABOUT eight miles west of Rouen by road, on a peninsula formed by bends of the Seine, and rather more than a mile from the river, is the Abbey of St. Georges de Boscherville, now consisting of little more than the church and chapter-house. The village church is dedicated to St. Martin de Boscherville, and may have been founded by some Frankish Balcher or Baucher on his *villa* or estate. The abbey, however, grew out of a little chapel dedicated to St. George, and was founded by Radulphe or Raoul de Tancarville, the Grand Chamberlain of William the Bastard. The charter of foundation cites William as Duke of Normandy, and also mentions Matilda, which would place it after 1053, when he married Matilda, and before 1066, when he became King of England. The canons, however, were already in possession when the deed was drawn up; and the building of their monastery, therefore, may have begun as early as 1050, or thereabouts. At first the abbey church was served by Augustinian canons; but these were replaced by Benedictine monks in 1114, as happened in many churches both in Normandy and England about this period. Till the extinction of that great family in 1305, the abbey was the special care of the Tancarvilles, receiving from them large endowments; near its high altar all, or nearly all of them were buried. The estates of the Tancarvilles passed to the Meluns; then to the Harcourts; then to the Orléans-Longuevilles; all of whom kept up the intimate relation between the estates and the abbey. So that, though a great abbey church, it was, like our own Tewkesbury abbey, to a large extent always a family chapel. The number of monks seems at no time to have been very large; the establishment was by no means on the scale of the neighbouring abbeys of St. Wandrille, Jumièges, and St. Ouen, Rouen. In the XIIIth century there were only twenty monks; in the XIVth century there were from ten to fifteen; in the middle of the XVth century there were but eight; in 1790 there were but seven. Outside Normandy St. Georges possessed three priories or manors, Awesbury, Winterborne, and Weston or Edwiston, all in England. In 1390 the abbey sold the only one left, Edwiston, to the priory of St. Anne of Coventry for 100 gold florins; alien priories in England were a dangerous form of investment in those days. In Normandy the abbey had eight priories; it also had the patronage of thirty churches. Though never among the richest of the abbeys, it steadily gained in wealth, till under Francis the First there came in the system of appointing abbots *in commendam*, hardly ever Benedictines, but secular priests, very often non-resident. Among these may be mentioned two of the Cardinals d'Este, one Archbishop of Lyons, the other of Auch. The result was disastrous to the abbey; at the beginning of the XVIIIth century the abbot appropriated from 20,000 to 25,000 livres of its income, leaving only 10,000 livres to the abbey. At the Revolution the abbey had an income of over 20,000 livres; the abbot had 40,000. Like most of France, too, the abbey suffered greatly from the religious wars. In 1562 it was sacked by the Huguenots, and all the accessories of worship were destroyed. This was repeated in 1570. In 1590 the abbot's hall was burnt down, and much damage was done also to the church, which remained unrestored for many years. The XVIIth century was marked by a great reform of the Benedictine Order throughout France; at St Georges the claustral buildings, with the exception of the chapter-house, seem to have been wholly rebuilt, and the damage to the church to have been made good in this and the following century; to this work belongs the considerable repairs on the south side of the nave done in the style of the XVIIth century. At the Revolution the monastery and the church were offered separately for sale. The village, which originally had centred round the old parish church of St. Martin, had long ago drifted away to the neighbourhood of the abbey; the parish church was out of repair; so the abbey church was bought for 10,000 francs to serve as parish church, which it does to this day, after the manner of our Benedictine abbey churches of Tewkesbury, Sherborne, and Selby. In 1822 the Norman archæologists succeeded in saving the chapter-house also, with the aid of a grant of 3,000 francs from the Ministry of the Interior.

St. Georges de Boscherville is one of the largest Romanesque churches in Upper Normandy, the best preserved, and the least altered. The chapter-house was built by Abbot Victor, probably in the last quarter of the XIIth century; the high vaults of the nave and transepts, and the upper parts of the two western towers with their stone spires, were built about the middle of the XIIIth century; the central spire of wood is a later work; damage done to the north side of the nave was repaired late in the XIVth or early in the following century; and damage of the south side was repaired in the XVIIth century. Otherwise the church is wholly Romanesque. The result is that it presents a homogeneity and uniformity of design which is exceedingly striking. From eastern apse to western front there is hardly the slightest change in design; the whole church would seem to have been built without break or intermission and with extreme rapidity. Internally, the church is 66 mètres 30 long; with a transept 31 mètres 44 long; the nave is 38 mètres 90 long, 8 mètres 20 broad, and 15 mètres 77 high; the walls are 1 mètre 75 thick. On plan it has an aisled nave of eight bays; transepts of one bay, each with a semicircular eastern apse; the aisled choir contains two bays. Each aisle of the choir terminates eastward in a semicircular apse, which externally is rectangular, as at St. Nicholas, Caen, Lessay, St. Gabriel, Bernay, Longueville, Romsey, and Durham. East of the two bays of the choir is a narrow bay covered with a barrel vault; east of this again is a semicircular apse of five bays covered with a ribbed semi-dome. Each transept has a return gallery; that of the north transept is shown in the illustration. These return galleries occurred also at St. Stephen and St. Nicholas, Caen, Jumièges, Cérisy, St. Taurin, Evreux, St. Sernin, Toulouse, Preuilly-sur-Claise, Winchester, and originally at St. Ouen, Rouen and Ely. In Gothic work they occurred at Nôtre Dame, Eu, Laon, and Lincoln. The vaults belong to two periods. Those contemporaneous with the building of the church are those of the aisles of the nave and choir, and below the transeptal galleries; also the high vaults of the choir; all the above are groined, *i.e.*, unribbed; to the same work belongs the barrel vault east of the choir, and probably the ribbed semi-domes of the main apse, and of the transeptal apses. It is true that in the main apse the semi-dome is entirely independent of its ribs, which spring from short, stout columns, between which and the wall there is a thoroughfare passage round the apse. But the mouldings of these ribs are to be paralleled in parts of the church which are undoubtedly Romanesque. To the second period belong the high vaults of the nave and transepts and crossing. These are quadripartite, except that the crossing, like that of Amiens, which can be but little earlier in date, has also ridge-ribs; and that one supplementary rib occurs above the transeptal galleries, and two in the most western bay of the nave.

There is a single central doorway of great beauty in the west front; and smaller doorways in the most eastern and most western bays of the nave, both on the north and south sides. The cloister was north of the nave. There was no passage or slype between the north transept and the chapter-house. The latter is oblong; most monastic chapter-houses were divided into two or three naves by a row or rows of pillars; but that of St. Georges had no pillars. This seems to be a peculiarity of the Romanesque of Normandy, *e.g.*, Jumièges, and Rouen Cathedral. The chapter-house is an exquisite example of the Gothic of Normandy as contrasted with that of the Ile de France.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

AS USUAL, we illustrate by sketches some of those places of interest which the Architectural Association excursion are visiting this week. Some of them are referred to in another column dealing with the excursion. An account of the last days of the excursion and other sketches of places visited will appear in our issue next week.

CONGREGATIONAL CHURCH, EPSOM.—In our last issue, under the heading "General Building News," we stated that the architects of the New Congregational Church at Epsom were Messrs. Gregg and Stakley. It should have been "Gregg and Stapley."

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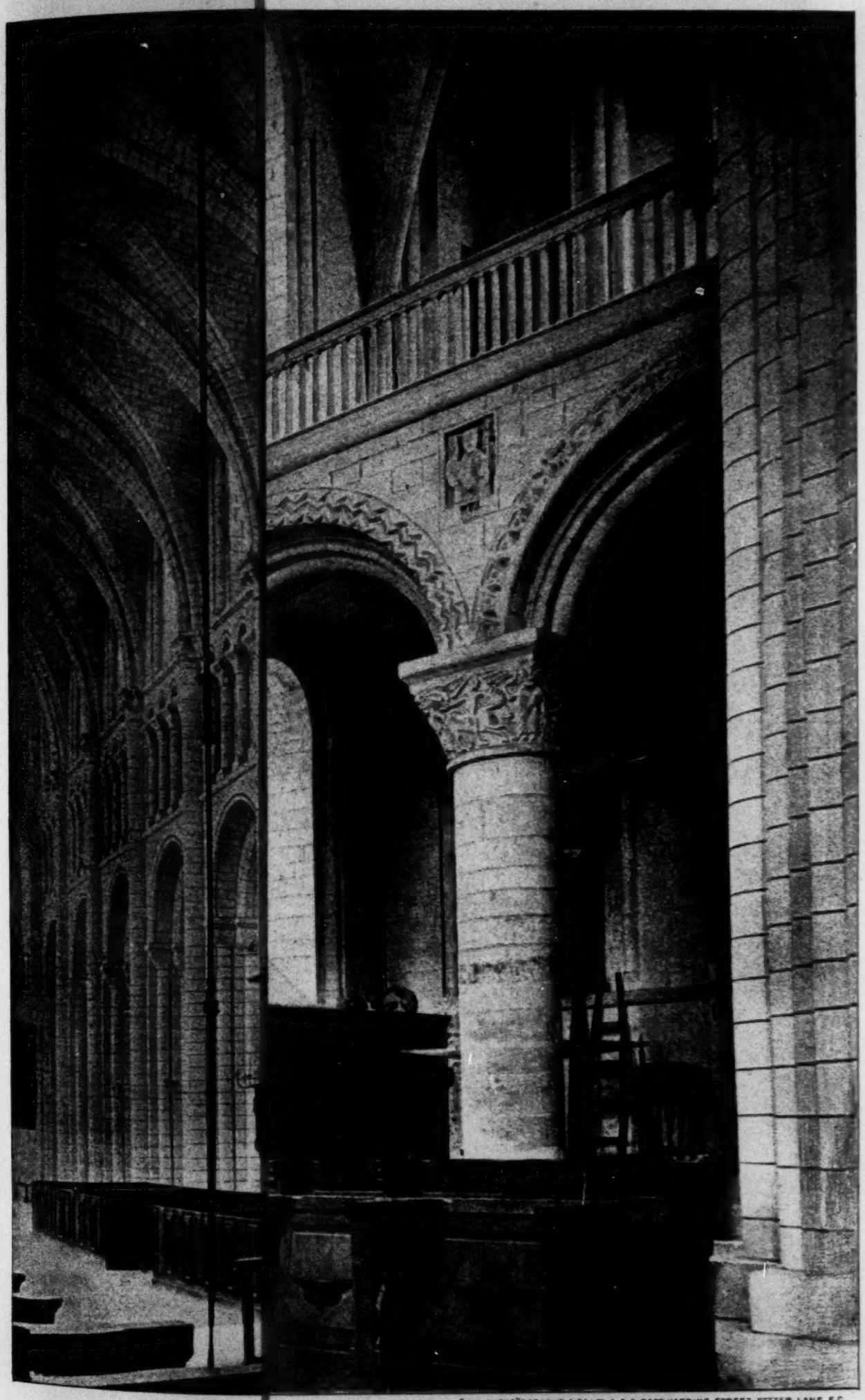

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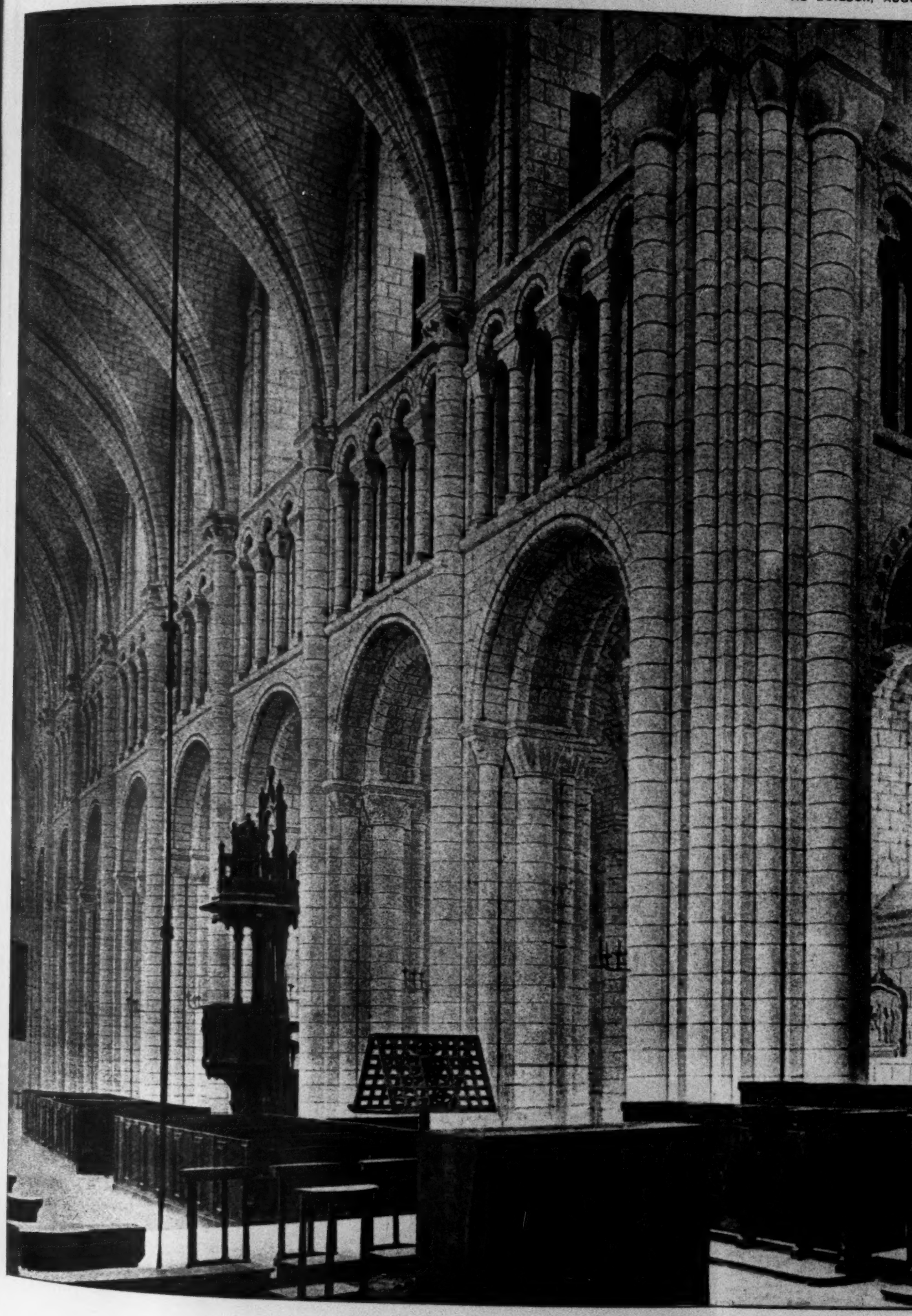

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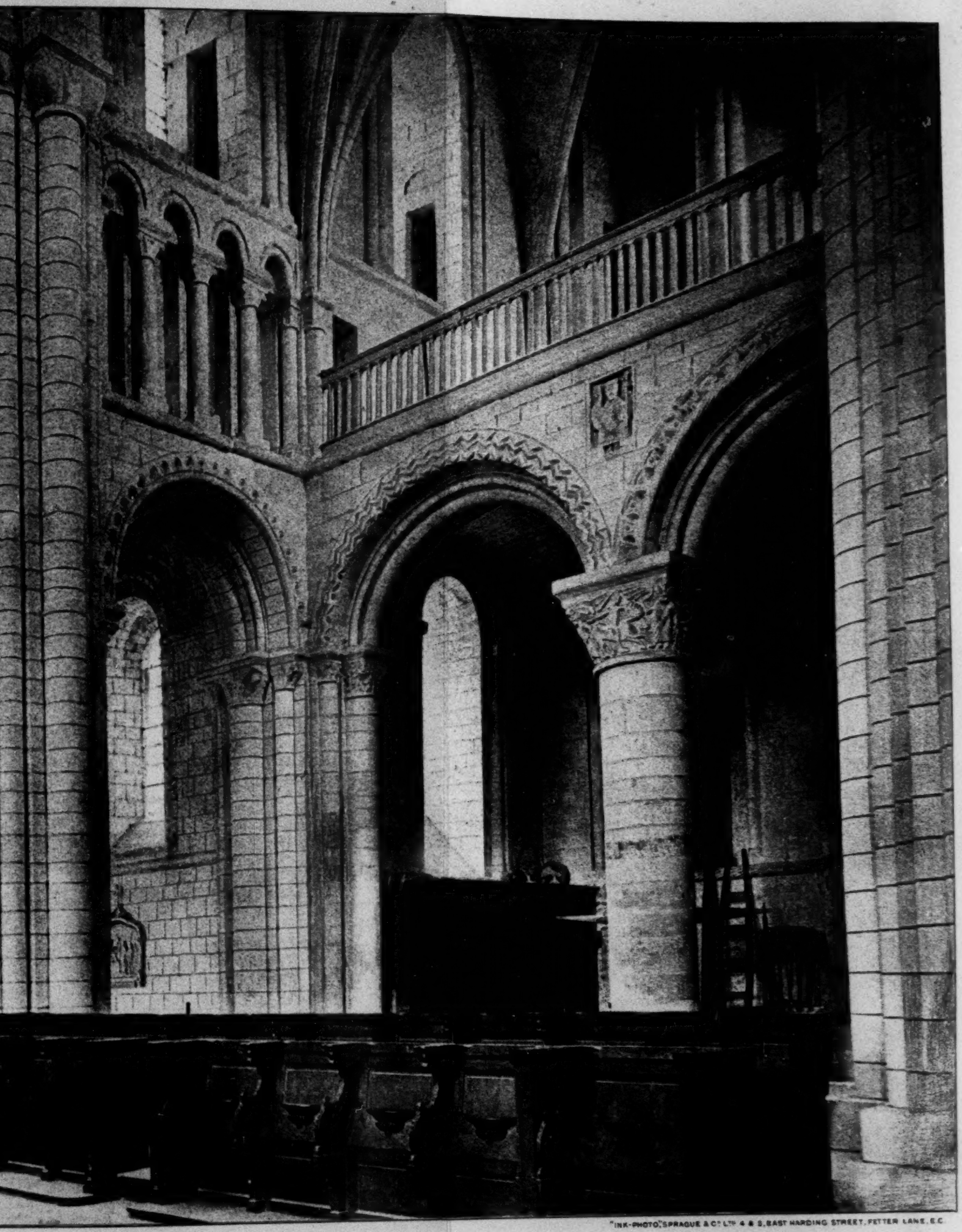

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E BOSCHERVILLE: NAVE, LOOKING WEST.

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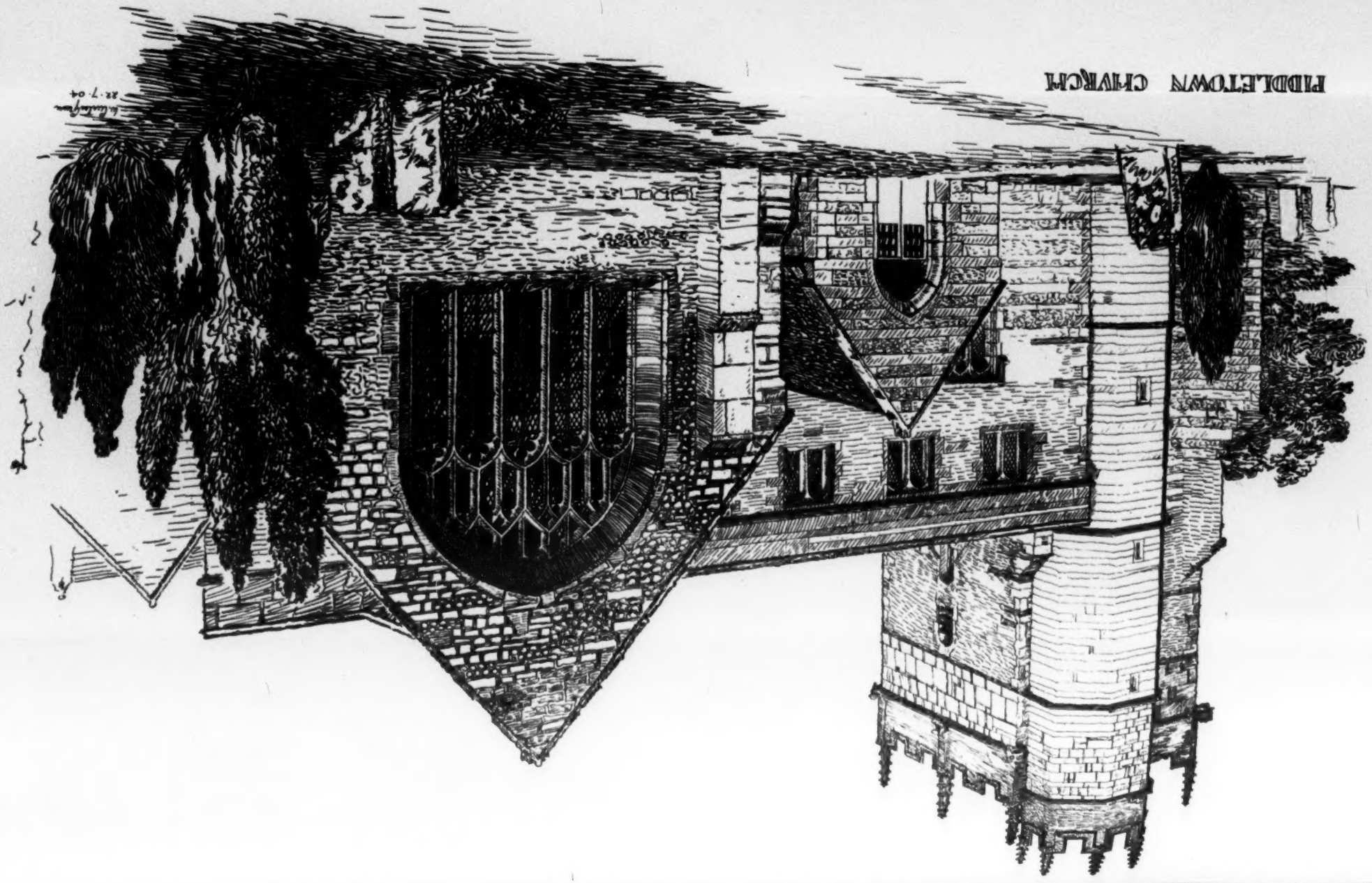
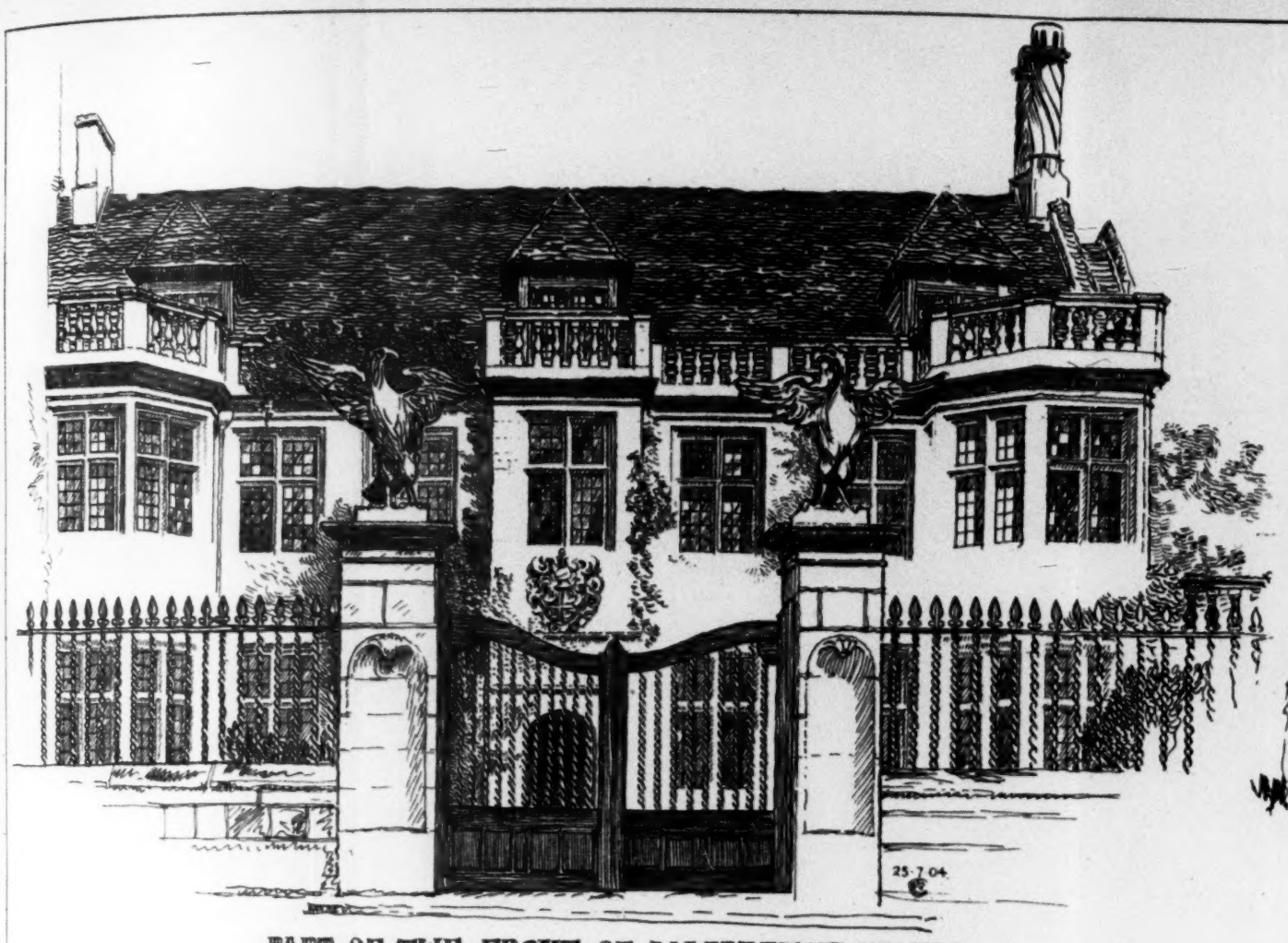
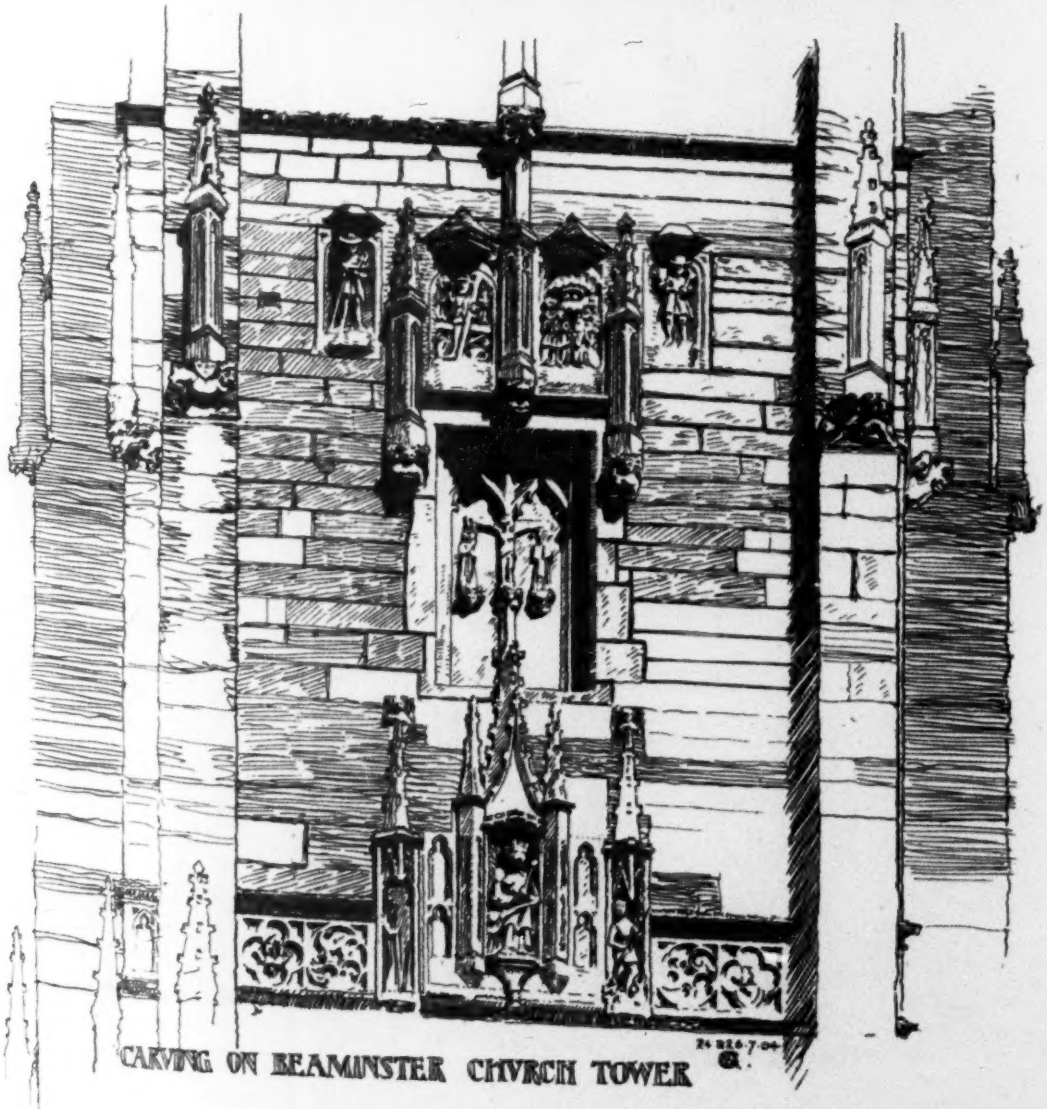


PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.



PART OF THE FRONT OF MAPPERTON HOUSE



CARVING ON BEAMINSTER CHURCH TOWER

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NORTH CADBURY CHURCH

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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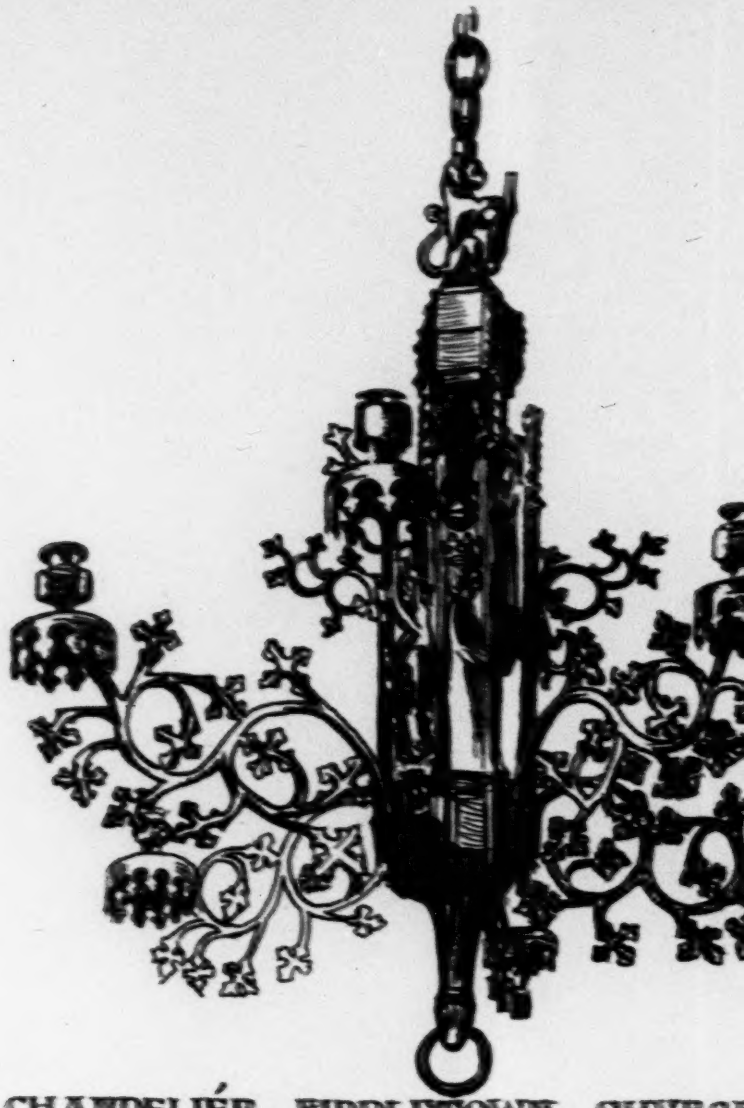

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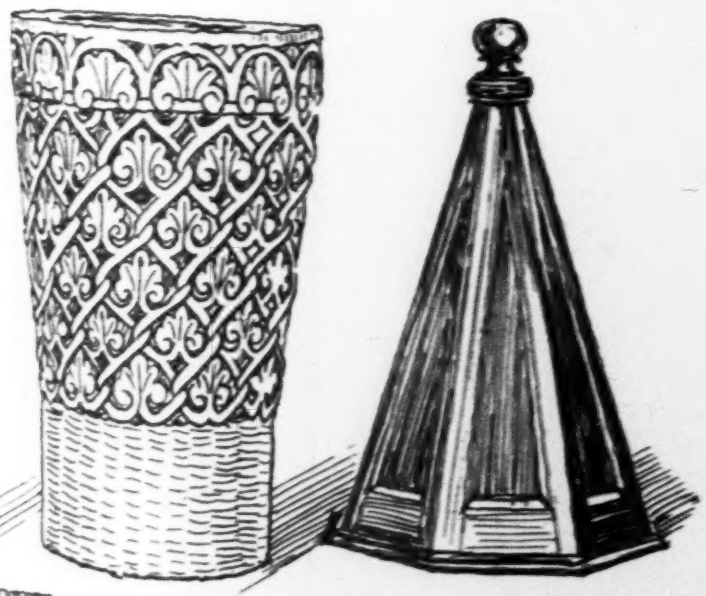

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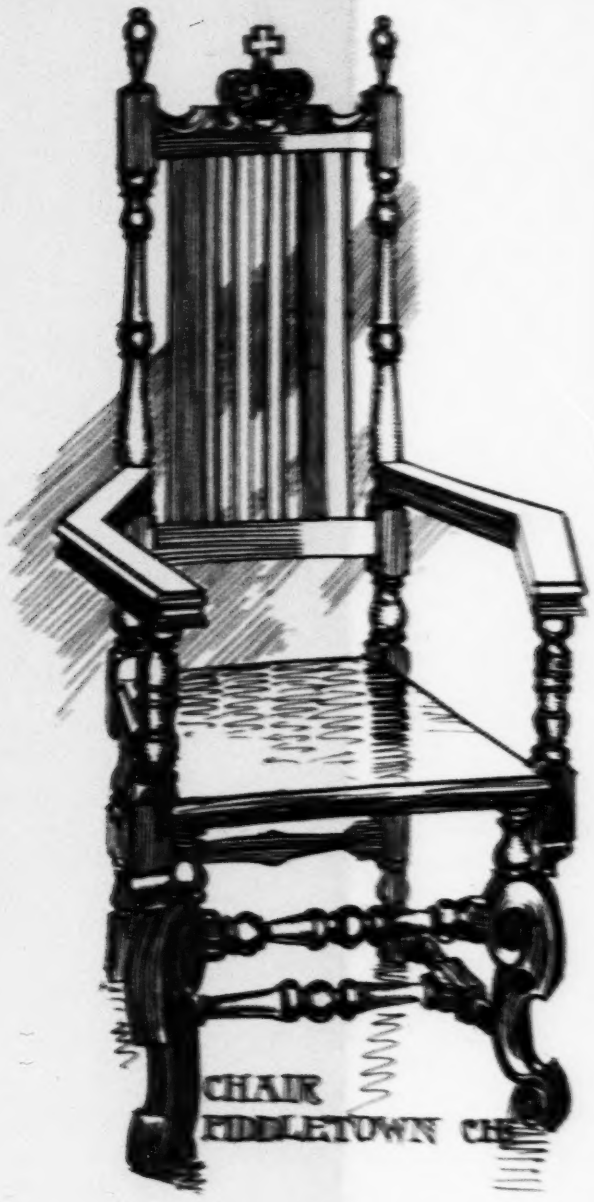

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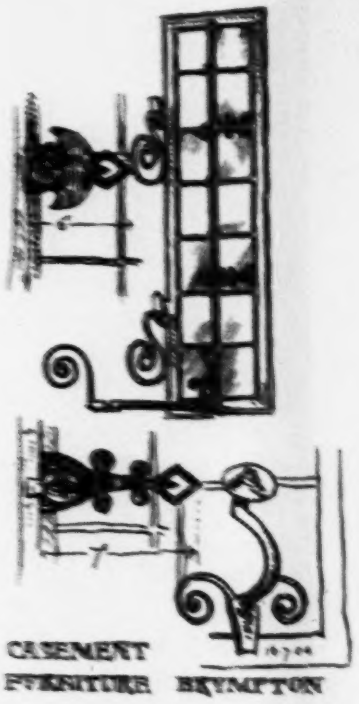

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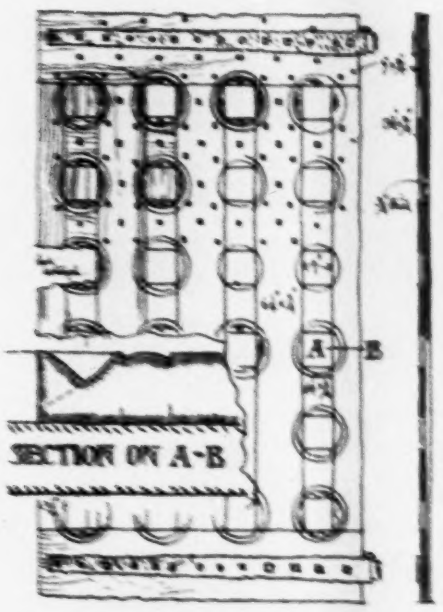

SECTION ON A-B

DOOR AT CLIFTON MAYBANK

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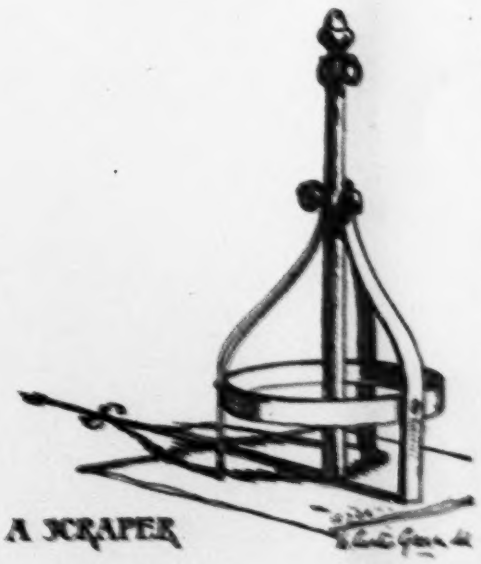

A SCRAPER

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STANDARDS OF PURITY FOR SEWAGE EFFLUENTS.*

"At first sight it does not appear to be so very difficult to decide whether a certain sewage or effluent is in such condition that it might safely be let into the river. What we aim at is, that the beds and banks of our rivers are kept free from foul sediments; that the water of our public water courses does not become turbid, discoloured, and foul, and that such water sustains fish life.

In some cases other requirements must be enforced; for instance, sometimes it is essential to maintain the river water in a condition suitable for utilisation for domestic supply; sometimes factories discharge only their refuse water into the river, others utilise the river water for manufacturing purposes, and require that not too much condenser or other hot waste water is discharged into the river, also, that the river water remains soft, and is not spoiled for their purposes by admixture with injurious chemicals.

It is not necessary in all cases to fulfil every one of the requirements. Often only one or two of them must be considered. The greatest difficulty to our question arises from the variability of the proportion between the quantity of sewage to that of river water, into which the former can be discharged. In one case we can let crude sewage into a stream without having to fear that the slightest detectable alteration of the river water will result. In other cases offensive changes of the river water can only be avoided by purifying the sewage very thoroughly before discharging it into the river. These facts show the hopelessness of all endeavours to find one standard which would suffice for all cases.

As long as we do not drop the idea that the admissibility of crude sewage or effluents into rivers might be judged by standards based exclusively on the chemical or physical nature of the sewage or effluent, we can never hope to come to decisions that are just and rational. The only possibility in this line would, according to my idea, be to succeed in finding a series of standards permitting us to individualise and to arrange matters so as to allow us easily to determine the standards best adapted to the local conditions of every single case. In fact, things will never work satisfactorily if bureaucrats are allowed rigidly to enforce one single or set of standards for all cases. We shall need the expert in every single case. It would, therefore, be a mistake to search for a reaction that would enable us in one and all cases to affirm whether a certain sewage or effluent is fit to be discharged into the river or not. Such a reaction indicating whether the effluents are sufficiently free from albuminous substances, or from certain products formed in the decomposition of proteids, could come in question in such case only where a thorough purification of sewage seems necessary.

It is not my intention to formulate definite propositions as to how many standards or classes of requirements would seem necessary, and which requirements ought to be made for the different standards or classes. I shall limit myself to the discussion of one question of fundamental importance, namely—Does what we know of sewage analysis to-day put us in a position to judge from the results of chemical investigation whether a certain sewage or effluent tends to undergo putrefaction or not? Of course there are cases where the nuisance does not so much consist in putrefaction, but where the waste water contains inorganic poisonous substances or chemicals influencing detrimentally the physical qualities of the water, or where coal dust or other mining refuse destroys the appearance of the rivers. But such difficulties only arise in certain relatively small districts. Town sewage, or such factory waste waters that contain putrescible matter, are of far greater general importance. At any rate, I shall have to limit myself to the discussion of these to-day. . . . Therefore, I modify my question as follows:—

Are we enabled to judge by the results of chemical analysis whether a certain sewage freed from suspended matter or a certain effluent tends to putrefy?

To this end several methods have been suggested, all of which were intended to give information as to the amount of putrescible substances contained in a certain sample. For a long time extensive use has been made of the oxygen absorption test. This method is founded on the observation that organic substances have a great affinity to oxygen. Here, in Britain, the albumenoid ammonia test is largely used. In Germany the determination of organic nitrogen is preferred, as it is believed to give more accurate results than the albumenoid test. Lately J. König has recommended an improved method for the determination of organic carbon, which is said to indicate also those putrescible organic substances which, being more resistant to decomposition, are not indicated by the methods mentioned before.

Still, not one of these methods can be expected to give perfectly accurate results. For the requirements of ordinary practice such exactness cannot be expected, nor is it necessary, since sewage—either domestic sewage or trade refuse—contains the most heterogeneous substances in quantities varying from minute to minute. The question, therefore, seems justified, whether the more simple methods would not suffice in common practice as well as the more complicated ones. Further on I hope to convince you that this really is the case.

Not long ago it was quite common to ignite the solid matter, and to reckon the loss of ignition as organic matter. Even nowadays we find reports based on this method of the determination of organic matter. Evidently, we cannot expect to get reliable results with regard to the amount of organic matter contained in sewage by this method. By ignition, ammonium salts, nitrites, nitrates, and sulphates, and eventually also alkaline chlorides, are decomposed and evaporated. The loss of weight caused by the breaking up of such inorganic matter figures as organic substances. By adding carbonate of ammonia or water containing carbonic acid these losses cannot be exactly compensated. By determinating the loss of ignition, therefore, satisfactory results with regard to the amount of organic substances in sewage are not obtainable. Much less can we by this method specify the different organic substances or determine their relative quantities. Nevertheless, even this method is, as we shall see further on, not entirely useless.

The determination of oxygen absorbed is also incorrect, in so far as not only organic but also certain inorganic matter is indicated by this method. Permanganate of potash is discoloured by ferrous salts, nitrites, sulphites, sulphides, ammonia, etc. Furthermore, some organic bodies are very easily oxydised, others only after exposure to boiling point for several hours. On the other hand, the organic substances do not absorb oxygen in proportion to their molecular weight. More especially some substances most characteristic of sewage, such as uric acid, absorb very little oxygen in proportion to their weight. Lastly, the determination of oxygen absorbed is not made uniformly, but in very different ways. . . .

It is plainly evident, therefore, that such results are not comparable. It is also clear that we cannot find out by the method in question any details as to the nature and relative quantities of the different organic substances present. Notwithstanding all these deficiences, I shall, later on, have to attribute quite an importance to the determination of the oxygen absorbed.

The determination of albuminoid ammonia is a British method, and is, as above-mentioned, used mostly in Britain. Its chief recommendation is that by this method only the proportion of organic substances containing nitrogen is indicated, and to such substances the objectionable putrefaction is above attributed. I cannot quite agree with this last opinion. It will suffice to mention the foul odour of sulphuretted hydrogen and of some carburetted gases, as well as of some fatty acids, etc., which are formed in decomposing sewage, in order to justify my opinion that we ought not to keep in view only the determination of nitrogenous organic matter. On the other hand, the nitrogenous organic substances evolve albuminoid ammonia in varying quantities. We cannot, therefore, draw any conclusions by the results thus obtained as to the nature and relative quantities of nitrogenous organic substances.

The determination of albuminoid ammonia is also made in different ways. Some boil after addition of magnesia in order to first remove free and saline ammonia. Thus part of the albuminoid ammonia is lost. But this loss may, as you know, be avoided by making a separate determination of the free and saline ammonia. Albuminoid ammonia is always present in very minute and variable quantities in sewage and sewage effluents. The slightest experimental error can, therefore, easily lead to differences of 100 per cent. or more in the calculation of the results.

For these and other reasons this method has not found favour in German laboratories In Germany the determination of organic nitrogen has, as mentioned before, been preferred within recent years. This determination of organic nitrogen has also its drawbacks. By this method, too, those substances that escape by boiling with magnesia are counted as free or saline ammonia, although the free and saline ammonia figures are far higher when determined by distillation than when measured by Armstrong's colorimetric method without distillation. Moreover, this determination again only indicates nitrogenous substances, but no other putrescible matter, and, lastly, the results obtained represent only minute quantities. Aside therefrom, this really complicated method, which requires a great deal of time, leads to reliable results only in the hands of very careful chemists, especially experienced in this line of investigation. According to my idea, the determination of J. König is far more useful than any of the methods mentioned above. Still, even this method does not permit us to judge what kinds of organic bodies are present and in what proportions. But König's method requires less time, is sufficiently simple, and, what is most important, the results are determined by means of balances.

After these explanatory statements I will now return to my question, whether by chemical analysis we are enabled to decide with certainty whether a given sample of sewage or effluent is liable to putrefy or not. According to my view this question can be answered in the affirmative in all those cases where we have to do with samples containing very small quantities of organic substances, as indicated by one of the above-mentioned methods. If, for instance, in a certain sewage or effluent we find a loss of ignition amounting to not more than two or three grains per gallon, or if we obtain an oxygen absorbed figure as indicated by Kubel's method of not more than about one or two grains per gallon, or by the four hours' test an absorption of oxygen amounting to not more than one grain per gallon, or albuminoid ammonia equivalent to 0·1 grains per gallon, or organic nitrogen of approximately 0·2 grains per gallon, or organic carbon about one grain per gallon, we can almost positively say that these samples will not undergo putrefaction. Are we now to understand that every sewage or effluent that contains a quantity of organic substances more or less exceeding these figures is liable to putrefaction?

The ingenuity and infinite pains which our leading men have brought to bear on the improvement, and on raising the accuracy of the methods in question, will, according to my idea, have brought us to a satisfactory end only if from the absolute figures obtained we are enabled to say with certainty whether any given sewage or effluent is liable to undergo putrefaction or not. I am sorry to say that expectations in this direction are not justified. . . . In England standards have been published by some Rivers Boards according to which sewage effluents are considered bad if they contain more than 0·1 or 0·112 grains per gallon of albuminoid ammonia, or if they absorb more than 1 grain per gallon of oxygen as determined by the four hours' test.

We may safely assume that these committees have laid down such requirements because they are convinced that any sewage or effluent in which albuminoid ammonia or oxygen absorption exceeds those figures will tend to undergo putrefaction. Now it is a fact that from very concentrated sewage we are able by means of biological treatment to produce an effluent clear, limpid, colourless, and free from odour, which will under no circumstances undergo putrefaction, yet which will give far higher albuminoid ammonia figures; for instance, 0·3 or even more grains per gallon of albuminoid ammonia, or will absorb, as determinated by the four hours' test, far more oxygen than is allowed by the above-mentioned standards.

I have brought with me a sample of effluent which absorbs 6·8 grains of oxygen per gallon determined by the four hours' test, that is to say, about the same amount of oxygen absorbed by the crude sewage of Manchester not freed from suspended matter by filtration. Moreover,

* Part of a paper by Prof. Dr. Dunbar (Hamburg) read before the recent Congress of the Sanitary Institute at Glasgow.

you here see samples in which 0·83 or even 1·37 grains per gallon of albuminoid ammonia have been determined. That means to say several times the amount of these substances allowed by the standards in question. These samples are so clear, colourless, entirely free from stench and non-putrescible, that the commissioners would doubtless be very pleased if all effluents let into their rivers were equally good.

How are we to understand these singular facts? According to my view, it would be a mistake to think that by biological sewage purification only about three-quarters of the soluble organic matters present are entirely removed from the sewage, the remainder staying unaltered in the effluent. We have good reasons to believe that by biological treatment the entire organic matter present in crude sewage is retained and decomposed. If, therefore, a crude sewage contains, say, about 3 grains per gallon of organic nitrogen, we must not believe that about one-third of the organic substances containing nitrogen had passed the plant unaltered; but we may suppose that, with the exception of those substances unusually resistent to decomposition, and, therefore, not liable to putrefaction, all of the organic matter has been decomposed, and that those substances giving the reaction of 1 grain per gallon of organic nitrogen are entirely different substances not liable to undergo putrefaction.

The effluents from biological plants always contain substances which determined by the methods spoken of are called albuminoid ammonia, organic nitrogen, organic carbon, etc. If, for instance, the crude sewage freed from suspended matter contained 6 grains per gallon of a certain substance, we find in the effluent from a biological plant in good working order about 1·5 to 2 grains per gallon; if the crude sewage contained 4 grains per gallon of the same substance, we find in the effluent 1 to 1·5 grains per gallon, and so on in proportion to the concentration of the crude sewage.

If we make all the determinations spoken of in one effluent we generally find the percentage of reduction to be the same, or about the same, in all the different determinations. This observation was made so often and on such different sorts of sewage and effluents that Dr. Thumm and I a few years ago came to the conclusion that any one of the methods described would give almost equally reliable results as the other methods, and that, therefore, it would in general practice suffice to use the simpler methods only, as, for instance, the determination of oxygen absorbed.

But the substances indicated by our methods in the effluents are not identical with the putrescible matter contained in the organic crude sewage. These subjects certainly contain nitrogen and carbon, but they are products of decomposition fully oxydised and non-putrescible. Therefore it ought to be of very little consequence whether the effluent contains 0·1 or 0·2 grains per gallon, or even several times as much as these substances as indicated by the albuminoid ammonia test, or whether we find 1 or 2 grains per gallon of oxygen absorbed or even much larger amounts, as long as these substances are non-putrescible and not harmful to fish, even if they are placed into the concentrated, not diluted effluents. Such effluents should be considered as harmless, and we ought not, therefore, to object to their being discharged into our rivers.

In a town with a relatively low water consumption we find comparatively concentrated sewage, and, therefore, in such case the absolute quantities of organic substances contained in a gallon of effluent will be higher than in the case of a town showing a larger consumption of water, and yet the effluent in the former case may be equally fit to be discharged into the river.

This sample, for instance, is an effluent derived from town sewage treated biologically. Ought this effluent, looking nearly as clear and limpid as pure well water and being absolutely free from any offensive smell, and entirely non-putrescible, to be considered bad, and not fit to be discharged into a river because it absorbs 2·18 grains of oxygen per gallon determined by the four hours' test?

We come, as I have explained, to similar results by the determination of albuminoid ammonia and of organic carbon. An excellent effluent may occasionally give figures by far exceeding those of a turbid, discoloured, crude sewage tending to undergo putrefaction.

Every attempt to formulate standards, based on absolute figures, must appear hopeless in the face of these results which I have just laid before you, and which are only extracts from a great number of analyses at my disposal all tending to prove the same.

Although I admit that the standards mentioned before may suffice in the case of certain cities, it would, to my idea, be a grievous mistake to generalise them. In many cases the effluents will just about not putrefy if they contain 0·1 grains per gallon of albuminoid ammonia, or if they absorb 1 grain of oxygen per gallon. But in many cases we can only get satisfactory information as to the putrescibility of the effluents if we also know the nature of the crude sewage.

With a moderate degree of certainty we can by the appearance and smell of an effluent tell whether it will putrefy or not. But it must be admitted that this physical method of examination is not sufficient for all cases, and that even the judgment of a well-practised observer may be impaired by a cold or other indispositions.

The effluents when kept in a room in firmly-stoppered bottles for several days will, if not thoroughly purified, develop a smell of sulphuretted hydrogen, and this can hardly escape our sense of smell, even in quantities far too small to be detected by chemical analysis. This method of examination, although leaving nothing to be desired as to its simplicity and reliability, is yet one of those subjective ones which we want to avoid, and, besides that, it does not allow us to form a judgment before the lapse of several days. Now, in nearly all cases it is most desirable that the efficiency of a purifying plant can be ascertained at any time and at once.

A few years ago I observed when examining, together with Dr. Thumm, the effluents of biological purification works, that when either the oxygen absorption—determined by Kubel's method—or the loss on ignition, or the organic nitrogen showed a reduction of at least 60-65 per cent. in the effluent as compared with the crude sewage freed from suspended matter, these effluents were not putrescible. Since then I have made similar observations in regard to the reduction of organic carbon. I am not going to advance the statement that this ratio holds good for every sewage and every biological system. Still, we have as yet regularly found it confirmed in every domestic and town sewage as well as in different trade wastes. I am, therefore, inclined to hope that whereas absolute figures appear to be useless for our purpose, the percentage ratio between an effluent and the corresponding crude sewage may enable us directly to judge as to the putrescibility of that effluent. Fortunately we can in this case do without the above-mentioned complex methods, as the determination of oxygen absorbed gives us sufficiently reliable results.

Every one of the above-mentioned modifications of the determination of oxygen absorbed gives satisfactory results, if used for such calculation only. Of course it is necessary always to examine the crude sewage and the effluent both in exactly the same manner. Moreover, the above statements hold good only for sewage that has been freed from suspended matter. When examining the crude sewage unfiltered—as is usually done when making the four hours' test—the reduction is often found to amount to about 10 per cent. more than when comparing filtered crude sewage with filtered effluents.

To my idea, the examination of unfiltered samples is far more open to objection than the examination of filtered samples. The suspended matter in effluents of biological purification-plants is of an entirely different nature to that found in sewage. The former consists of, to a large extent, animal and vegetable organisms grown in the filter-beds, and which shoud be regarded from quite a different point of view than the suspended matter in crude sewage.

The determination of oxygen absorbed is the simplest of all methods in question, and if Kubel's modification is employed the results can be at hand within very few minutes. These, I think, are great inducements to the use of this test. Concluding, I should like to state that, according to my opinion, we can judge the putrescibility of effluents better by the percentage of reductions effected by biological plants than by standards based on absolute figures.

The absolute figures obtained even by the best methods of determining putrescible matter in sewage do not in all cases give definite indications as to the putrescibility of any given sample. Effluents of purification works may present a most satisfactory character, and yet under certain circumstances contain as large or even larger quantities of either organic carbon, organic nitrogen, and albuminoid ammonia; as high an oxygen absorption, and loss of ignition as other samples of crude sewage which are in a high degree liable to undergo putrefaction. We should, therefore, give up the attempt to find a standard of general applicability based on absolute figures.

A far safer judgment as to the putrescibility of effluents can be obtained by calculating the percentage of purification effected. Simple methods like Kubel's oxygen absorption test give results entirely sufficient for wants of practice, if used only for calculating the percentage of reduction. The analytical determinations spoken of are not needed in all cases. The requirement that all effluents should be absolutely non-putrescible needs only to be made where the river presents most unfavourable conditions, or where the river districts are densely populated. In many cases it will be sufficient to require only that all coarser suspended matter be removed from the sewage. In other instances all suspended matter, including finer particles, should be removed as efficiently as possible. In other cases, again, the authorities will have to insist not only on the removal of the entire suspended matter, but also on a reduction of between 40 and 50 per cent. of oxygen absorbed by the dissolved impurities, the determination being made after filtering the samples; and there will certainly be such cases, too, where it must be stipulated that the effluents are limpid and entirely non-putrescible.

It would be desirable that leading men in Britain and Germany, where the great questions of rivers pollution and sewage purification are at present being discussed more than ever before, should come to an understanding to carry out the examination of sewage on the same lines. In such case the large amount of analytical work carried out in both countries every day would lead to comparable results, and progress might be accelerated by mutual labour and interchange of ideas.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

At the meeting of the Building Act Committee of the London County Council, held on July 25, being the day before the Council adjourned for the Summer Recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the Committee's order of reference. The names of applicants are given in parentheses:—

Lines of Frontage and Projections.

Wandsworth.—Bringing forward the frontage of six houses on the north side of Rosendale-road, Herne-hill, between No. 1, Park-villas and Guernsey-grove (Mr. P. C. Davies for Messrs. R. Parry, H. Eaborn, and F. J. Chapman).—Consent.

Hampstead.—The erection of one-story buildings on the east side of West-end-lane, Hampstead, northward of "Tower Mansions" (Mr. A. Whitelaw for the London and North-Western Railway Company).—Consent.

Lewisham.—Twelve houses on the northern side of Rutland-road, Perry-hill, Catford (Mr. W. C. Poole for Mr. J. Johnson).—Consent.

Clapham.—Buildings on a site abutting upon the south side of Clapham Park-road and the east side of Park-hill, Clapham (the Metropolitan Borough of Wandsworth).—Consent.

Battersea.—A pumping station on a site abutting upon the east side of York-road and the north side of Creek-street, Battersea (Mr. M. Fitzmaurice for the Main Drainage Committee of the Council).—Consent.

Hampstead.—A porch at a house in course of erection on the east side of Finchley-road, Hampstead, northward of "St. Hilda" (Mr. A. O. Breeds for Mr. C. Tavener).—Consent.

Kensington, South.—The retention of an illuminated sign at the "Kensington Arms" public house, Warwick-road, Kensington (Mr. T. H. Smith for Mr. A. N. Foley).—Consent.

Marylebone, East.—Balconies in front of Nos. 2, 3, 4, and 5, Duke-street, Portland-place, St. Marylebone (Messrs. Boehmer and Gibbs for Messrs. Matthews, Rogers, and Co.).—Consent.

Islington, East.—A warehouse building at the rear of No. 32, Newington-green, Islington, to abut upon Matthias-road (Mr. J. H. Storrar for Mr. C. Fell).—Consent.

Hackney, South.—An addition to a warehouse building at No. 17, Sutton-place, Hackney, abutting upon Urswick-road (Mr. J. Hamilton for Mr. T. C. Wootton).—Refused.

Kennington.—Buildings on a site on the southern side of Wandsworth-road and the eastern side of Southville, Kennington (Mr. H. Bignold for Mr. O. Camburn).—Refused.

Lewisham.—The retention and completion of a porch and coal cellar at No. 163, Wellmeadow-road, Lewisham, abutting upon Dowanhill-road (Mr. E. J. W. Hider for Mr. F. Taylor).—Refused.

Lewisham.—An addition at the rear of No. 37, London-road, Forest-hill, to abut upon Queen's-road (Messrs. Dorrell Brothers for Mr. A. J. Dorrell).—Refused.

Marylebone, East.—A one-story lavatory at No. 62, Portland-place, St. Marylebone, to abut upon Weymouth-street (Mr. H. Lake for Mr. W. Tebb).—Refused.

Strand.—Two projecting signs in front of No. 25, Charing-cross, Strand (Mr. J. N. Taylor for the Great Western Railway Company).—Refused.

Wandsworth.—A bay window and wood cornice and pediment at No. 13A, Devonshire-road, Balham (Mr. N. H. Meyrick for Mr. W. Scott).—Refused.

Woolwich.—A verandah and the use of half timber work at a building on a site situated between Nos. 194 and 220, Plumstead-common-road, Plumstead (Mr. F. Bethell for the Royal Arsenal Co-operative Society, Ltd.).—Refused.

Width of Way.

Hampstead.—An addition to Christchurch Cottage, Christchurch-passage, New-end, Hampstead, with the boundary fence at less than the prescribed distance from the centre of the roadway of the street (Mr. J. D. Hunter for Mr. E. A. Rusher).—Consent.

Hampstead.—An addition to Christchurch Cottage, Christchurch-passage, New-end, Hampstead (Mr. J. D. Hunter for Mr. E. A. Rusher).—Refused.

St. Pancras, East.—A two-story building on the north-east side of Rochester-place, Camden Town, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. T. B. Westacott for Messrs. G. Skey and Co., Ltd.).—Consent.

Paddington, North.—That the application of Mr. J. H. Bethell on behalf of the London and South Western Bank, Ltd., for an extension of the periods within which the erection of buildings on the north side of Harrow-road, Paddington, westward of No. 474, was required to be commenced and completed, be granted.—Agreed.

Southwark, West.—A building on the south side of Clink-street, Southwark, eastward of Bank-end, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. H. Baerselman).—Refused.

Lewisham.—Five buildings on a site abutting upon the north side of Marischal-road, High-road, Lee, with external walls and boundary fences at less than the prescribed distance from the centre of the roadway of Marischal-road (Messrs. D. Smith, Son, and Oakley for Earl St. Germans).—Refused.

Width of Way, Lines of Frontage and Projections.

Strand.—A building upon the site of Nos. 17, 18, 19, 20, and 21, Tavistock-street, Covent-garden (Mr. E. L. Lutyens for Sir G. Newnes, Bart.).—Consent.

Marylebone, East.—A building upon the site of No. 54, Harley-street, St. Marylebone, with external walls at less than the prescribed distance from the centre of the roadway of Mansfield-mews, and with a bay-window and balcony abutting on Harley-street (Messrs. Niven and Wigglesworth for Dr. J. Galloway).—Consent.

Bermondsey.—Buildings on the east side of Wild's-rents, Long-lane, Bermondsey (Mr. E. Crosse for the Old English Vinegar Company, Ltd.).—Consent.

Hampstead.—An iron and glass covered way in front of "Normanhurst," Priory-road, West Hampstead (Messrs. Baker and May for Mr. F. P. Scholte).—Refused.

Paddington, North.—A one-story addition upon part of the forecourt of No. 11, Warwick-road, Paddington, abutting also upon Warwick-place (Mr. J. Martin for Mr. H. B. Merton).—Refused.

Buildings for the Supply of Electricity.

Paddington, South.—A sub-station on the east side of Salem-road, Moscow-road, Paddington (Mr. W. H. White for the Metropolitan Electric Supply Company, Ltd.).—Consent.

Marylebone, West.—The use of a portion of the ground floor of No. 34, North-street, St. Marylebone, as a battery-room (Mr. J. S. Highfield for the Metropolitan Electric Supply Company, Ltd.).—Consent.

Norwood.—A roof over a grease separating plant at the generating station at Bengeworth-road, Norwood (Messrs. Kincaid, Waller, Manville, and Dawson for the South London Electricity Supply Corporation, Ltd.).—Consent.

Formation of Streets.

Hammersmith.—That the application of Mr. W. G. Ingram for an extension of the period within which the widening of Heath-place, Uxbridge-road, Hammersmith, to 40 ft. was required to be carried out, be granted.—Agreed.

Lewisham.—That an order be issued to Mr. E. Van Putten sanctioning the formation or laying out of a new street for carriage traffic to lead out of Porson-street, Lewisham (for the Council of the Metropolitan Borough of Lewisham).—Consent.

Lewisham.—A deviation from the plan sanctioned for the formation of a new street to lead out of Porson-street, Lewisham (for the road, Lewisham (Messrs. J. Jenkins and Sons for Mr. J. Martin).—Consent.

Hackney, North.—That an order be issued to Mr. G. H. Lovegrove sanctioning the formation or laying out of a new street forming an approach to six buildings erected upon a site at the rear of houses on the east side of Upton-road, Hackney (Mr. R. E. Maskall).—Consent.

Wandsworth.—That an order be issued to Mr. J. C. Radford sanctioning the formation or laying out of new streets for carriage traffic out of the west side of Gwendolen-avenue and south side of Hazlewell-road, Putney (for Lord Westbury).—Consent.

Space at Rear.

Battersea.—Certain alterations to premises on the north side of Green-lane, Battersea (Mr. F. Banister for the Committee of the Battersea Liberal Club).—Consent.

Westminster.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of "Hopkinson House," upon a site abutting upon Vauxhall-bridge-road, Edward-street, and Douglas-street, Westminster, with an irregular open space at the rear (Mr. R. S. Ayling for the Brabazon House Company, Ltd.).—Consent.

Westminster.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a block of buildings on the site of No. 82, Vincent-square, Westminster, with an irregular open space at the rear (Mr. R. S. Ayling for Miss E. M. Smith).—Consent.

Lines of Frontage and Space at Rear.

Paddington, South.—A projecting porch and bay window in front of No. 35, Albion-street, Hyde-park, and of an additional story on the back addition of such building (Mr. S. Skrimshire for Mrs. Moncreiffe).—Refused.

Space at Rear and Means of Escape.

Newington, West.—A building upon a site on the eastern side of Newington-causeway and southern side of Union-road, Newington, with an open space about such building and means of escape in case of fire from the fifth (top) story of such building (Mr. W. G. Scott for Lord Radstock).—Refused.

Alterations to Buildings.

St. George, Hanover-square.—A building on the site of St. George's Chapel, Albemarle-street, St. George, Hanover-square, and to alterations to No. 27, Albemarle-street (Mr. C. G. Miller for Messrs. Viola, Ltd.).—Refused.

Artizans' Dwellings.

Battersea.—Three intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses on the east side of Stainforth-road, Battersea (Mr. E. Cannell for Mr. F. Priddis).—Refused.

BOOKS RECEIVED.

THE CATHEDRALS OF NORTHERN FRANCE. By Francis Miltoun, with 80 illustrations, plans, and diagrams, by Blanche McManus. (London: T. Werner Laurie. 6s. net.)

PORTLAND CEMENT. By A. C. Davis. (London: Offices of the *Stone Trades Journal*, Southampton-street, W.C.)

THE PURIFICATION OF SEWAGE. By Sidney Barwise, M.D.Lond., B.Sc., etc. Second edition, revised and enlarged. (London: Crosby Lockwood and Son.)

THE TELEPHONE SERVICE. By H. L. Webb, M.I.E.E. (London: Whittaker and Co. 1s. net.)

Correspondence.

"ACID" AND "BASIC PROCESSES."

SIR,—I shall be much obliged if you will inform me, through the medium of your journal, the difference between the terms "acid process" and "basic process," as applied to the manufacture of steel.

T. F. D.

[*** In making steel by the "acid process," the lining of the converter, or of the furnace as the case may be, consists of highly siliceous material, such as ganister, which is capable of acting as an acid at high temperatures, and of fluxing when in contact with basic substances.

In the "basic process" of steel-making, the lining is composed of dolomite (double carbonate of calcium and magnesium), or of magnesium carbonate.

As originally employed, the Bessemer converter was lined with ganister, and the steel produced was made by the "acid process." So long as pure hæmatite pig iron was used, this form of lining presented no disadvantage, but the need for utilising iron made from phosphoric ores led to the adoption of a basic lining, the reason being that the elimination of phosphorus is adequately effected only in the presence of a base capable of forming a stable phosphate with the oxidised phosphorus. Similarly, an open-hearth furnace, such as that used in the Siemens-Martin process, may be worked with an "acid" or with a "basic" lining.—ED.]

The Student's Column.

NOTES ON PORTLAND CEMENT.

CHAPTER V.—SOUNDNESS.

ONE of the most important tests to which cement is subjected is that for its constancy of volume or soundness. This test cannot safely be carried out by a novice, and, in the hands of an expert, extreme care must be taken. The greatest difficulty encountered is in the making of the pats. In all kinds of material testing the preparation of the specimen and the method of conducting the operation are as important in their influence on the result as the character of the test itself. This is particularly the case with Portland cement. To carry out the test, pats of neat cement about 3 in. diameter, ½ in. thick at the centre, and tapering to thin edges at the circumference are made on a glass plate, and, as in the other tests, the paste should be of normal consistency, thoroughly mixed, and the pat worked well to get rid of air bubbles. Unless care is used in trowelling, strains may be introduced into the mass which develop cracks. A good plan is, after moulding, to tap the glass gently, which re-arranges the molecules, making a more uniform pat free from tension strains. Since Faija introduced his hot-water apparatus, hot-water or boiling tests have been universally used. In the Faija test the pat is placed immediately after making into the apparatus and steamed at a temperature of 100° to 105° F. till set; it is then placed in water and kept for the remainder of twenty-four hours at a temperature of 115° to 120° F.

For Michaelis's test the originator gave precise instructions for carrying it out. He specified that "a clear pat of Portland cement made upon filter paper on a glass plate" should be allowed to harden in air and water for twenty-four hours. At the expiration of this time it was to be put into water of normal temperature and gradually brought to the boil, at which point it was to be kept for three hours. The pat thus treated should be firm, hard, and free from cracks. Since Michaelis introduced his test it has been shown by several experimenters that unsoundness due to excessive amount of magnesia is not developed much under six hours. There are numerous other hot tests for soundness, chief of which are:—

(1) Deval's. In this test pats of cement are allowed to set, then placed in a steam bath and heated for twenty-four hours at a temperature of 80° C. This is quite as severe a test as Michaelis's and in some instances the author has found slight movement in pats thus treated, while the same cement has stood Michaelis's test perfectly. This, however, may have been due to the preparation of the test pieces.

(2) Heintzel's ball or glow test. Balls are made by working the cement paste in the hands. They are then allowed to set sufficiently to take only slight impression of the finger-nail. They

—	Hours in Bath.	Temperature of Bath ° C.	Expansion per cent.	Tensile Strain per sq. in.	—	Briquettes in Water of Normal Temperature. Tensile Strain per sq. in.		Hard Set, in minutes.	Residue on Wire Sieve.		Pats 28 days in Fresh Water of Normal Temperature.	Second Hot Test after Aëration.				
						7 days.	28 days.		50*	76*		Hours in Bath.	Temp. of Bath.	Expansion per cent.	Tensile Strain per sq. in.	—
A	26	80	·32	300	Sound: Hard.	493	733	60	1½	6	Sound.	—	—	—	—	....
B	26	80	·72	220	" "	493	643	45	2	6	"	—	—	—	—	....
C	22	80	nil	300	" "	453	563	90	2	8	"	—	—	—	—	....
D	22	80	·12	300	" "	446	636	120	1½	6	"	—	—	—	—	....
E	22	80	·15	330	" "	520	663	45	3	8	"	—	—	—	—	....
F	22	80	·22	320	" "	430	650	60	1½	6	"	—	—	—	—	....
G	22	80	·15	230	" "	456	553	60	2	8	"	—	—	—	—	....
H	22	80	·15	250	" "	416	616	90	2½	10	"	—	—	—	—	....
I	22	80	1·33	100	Badly cracked.	400	656	240	1½	5	"	24	80	·07	290	Sound: Hard.
J	26	80	2·16	100	" "	493	733	60	1½	6	"	22	80	·32	300	" "
K	26	80	4·4	†	" "	493	643	45	2	6	"	24	80	·72	220	" "
L	22	80	2·04	100	Cracked.	530	716	90	1	5	"	22	80	·15	360	" "
M	22	80	2·01	*	"	446	636	120	1½	6	"	24	80	·12	300	" "
N	22	80	·75	*	Slightly cracked.	273	476	120	¾	4	Very slight move.	24	80	−·02	280	" "
O	22	80	·80	100	" "	564	630	60	1½	6	Sound.	24	80	·02	330	" "
P	22	80	1·20	*	" "	536	676	60	1	6	"	22	80	nil	240	" "
Q	24	80	5·44	†	Swelled much: Soft	470	640	30	1½	6	"	22	80	1·8	*	Cracked.
R	24	80	5·84	†	" " "	463	576	45	1½	6	"	22	80	2·72	†	"
S	24	80	5·92	†	" " "	440	603	60	1½	6	Very slight move.	24	80	3·12	†	"

* Broke under 100 lb. † Too large to fit clips of machine.

are then placed on thin sheet-iron and heated over a Bunsen burner, at first gently, and as the balls dry the heat is gradually raised till no more steam is given off. The balls should remain firm and hard.

(3) Tetmajer's test is very similar to Michaelis's, only balls instead of pats are prepared and boiled for six hours.

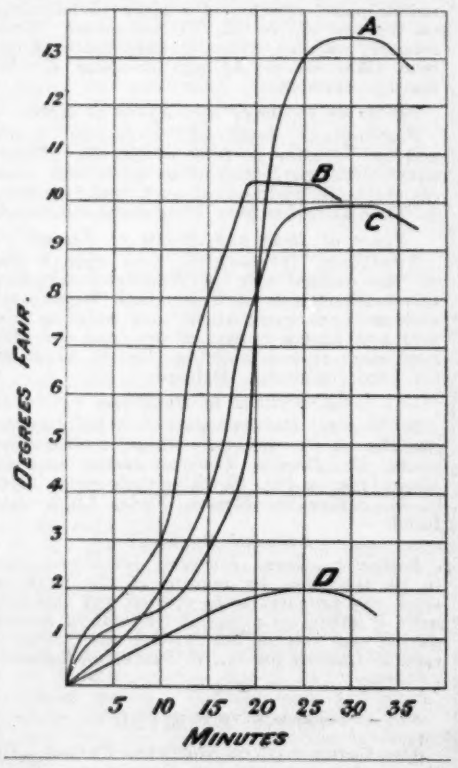
(4) Prüssing's compressed cake test. The cement is mixed with from 5 to 8 per cent. of water, then placed evenly in a mould and subjected to a pressure of 50 atmospheres. The cakes taken from the moulds are allowed to harden twenty-four hours, precautions being taken to prevent drying. The cakes are then placed in cold water for from two to twenty-four hours, then placed in a hot-water bath of 90° to 100° C. According to the originator of the test, cakes which showed no change after being four hours in hot water were generally considered of sound cement. If after twenty-four hours no visible change had taken place, then the cement was certainly sound under hardest conditions, and, if these cakes showed also particularly good strength, then these cements were good as regards this quality. It is almost impossible to obtain a cement which will stand this test, the tendency to warp being due to the manner of preparing the cakes.

About eight years ago the author experimented with a large number of cements with the view of obtaining quantitative results for "soundness." The change of volume in briquettes which were boiled or steamed was measured by means of Michaelis's micrometer and the briquettes then tested for tensile strain. The results, a few of which are shown in the table, were very interesting, but not reliable, owing to the large number of cements of that day being unfit to stand the hot test.

Much difference of opinion seems to exist as to the value of hot tests, as many cements which have failed to pass such tests have stood well in concrete work. It is generally accepted that a cement which will stand this test can safely be used, but should not be condemned on its failure to pass it. At present the only reliable test for soundness is to place a pat of neat cement in fresh water of normal temperature, where it should remain for about twenty-eight days, and examined from time to time for signs of movement. When this test is carefully carried out and the cement shows signs of "moving," it should not be used until a further test is made of the aërated sample. In many cases movement is caused by the extreme freshness of the cement, and can be overcome by aëration.

Test Tube or Bottle Test.—In this test the cement paste is poured into a bottle or test tube till it is completely filled and free from air bubbles. It is then allowed to set, and if, at the expiration of seven days, the vessel remains uncracked or the cement does not shrink it is considered sound. This is a very misleading test, and so many sources of error are possible that it should never be attempted except by an expert. The greatest care is necessary in getting the cement paste into the bottle or test tube and even then other causes than expansion through free lime may cause the glass to crack, such as sudden changes of temperature.

"Marmalade Pot" or Temperature Test.—A most misleading test, and one which causes the manufacturer much unnecessary trouble, is that advocated by Mr. G. F. Deacon a few years ago, and familiarly known as the "marmalade-pot" test. Mr. Deacon described it as "a perfectly simple and exhaustive test for free lime which can be made in a few minutes." It is as follows:—"A hand sample of cement, a small vessel of water, a marmalade pot, and a thermometer are left together for a short time to acquire a uniform temperature. The cement is then gauged in the pot as quickly as possible, with just sufficient water to render it plastic, and the thermometer, being immediately pressed into it, the initial temperature is recorded. If within fifteen minutes the rise of the thermometer exceeds 2° F., or within sixty minutes 3° F., the cement is further exposed before use." A large number of cements have been tested by the author for rise of temperature during setting, and in most cases the samples showing the greatest increase have been perfectly sound under the hot-water test. The diagram shows the results of four samples thus tested. A., B., and C. were sound after steaming for twenty-four hours at 80° C., while D. was badly cracked under similar treatment.



Mr. D. B. Butler, in his paper on "The Finer Grinding of Portland Cement and the Comparative Value of the Coarser Particles," described some experiments to ascertain the relation between the setting properties of cement and the heat evolved during setting, and also how far the theory was correct that little or no increase in temperature pointed to the absence of free lime "that is a 'sound cement.'" Samples were tested in the Faija apparatus. One sample which showed an increase of 9° F. in sixty minutes during setting, when ground extremely fine showed an increase of 29° in thirteen minutes, and the fine grinding had rendered it perfectly sound. Several samples of unsound cement were secured and re-ground. Greater increase of temperature was shown on gauging the re-ground samples than the original ones, but the fine grinding had rendered them nearly or quite sound when subjected to the Faija test. One sample specially prepared, containing a large amount of free lime, showed an increase of 17°F. in thirty-five minutes during setting. The same sample mixed with 2 per cent. gypsum and rendered very slow-setting increased only 1° F. in fifteen minutes and was still unsound. A large number of similar cases might be cited to show the absurdity of this test as one for "soundness." Unsound, over-limed cements are generally slow setting and evolve little heat. It is the coarse grains containing free lime, which slake only slowly and expand after the cement is set, which are dangerous. The rise of temperature when cement is mixed with water is less due to the heating of the free lime than to the crystallisation of the cement compounds. The heat evolved by the latter action is much greater than from the slaking of free lime.

GENERAL BUILDING NEWS.

CHURCH, NEAR LLANDRINDOD WELLS.—The foundation-stone has just been laid of the new church for the parish of Disserth, which is being built near Crossway, Howey. The architect is Mr. R. Wellings Thomas, Llandrindod Wells; and the contract has been entrusted to Mr. S. Arthur Bounds, also of Llandrindod Wells. The church will stand on a site 67 ft. by 22 ft., and it will be built of stones from Brynhir Quarry.

NEW CHURCH, SKEWEN, CARDIFF.—The foundation-stones were recently laid of a new parish church, which is to be erected at Skewen. The building will accommodate some 350, and is to be built of Morriston pressed bricks, with biscuit-coloured terra-cotta dressing. The style is Gothic. An organ chamber and vestry are provided. The architect is Mr. J. C. Rees, and the contractors, Messrs. Price Brothers, of Cardiff.

PRIMITIVE METHODIST CHAPEL, HOLMWOOD, SHEFFIELD.—The foundation-stones were laid a short time ago of a new Primitive Methodist chapel at Holmwood. The total cost of the work will be about 1,850*l*. The new chapel has been designed, in the Gothic style, by Mr. W. Cecil Jackson, of Chesterfield. The walls will be faced with red bricks, and will have stone dressings. The building, which will comprise a main hall, choir, and two vestries, will provide accommodation for 375 worshippers. There will be two front entrances and vestibules. The open timber roof will be covered in with blue slates. The timber work and furniture will all be of pitch-pine. The windows will be glazed with stained glass. The builders are Messrs. Brailsford and Randall, of Hasland.

PRIMITIVE METHODIST SCHOOL-CHAPEL, SHEFFIELD.—A new Primitive Methodist chapel and Sunday school are to be erected on a site in Abbeydale-road, Sheffield. The plans for the buildings have been prepared by Messrs. Hall and Fenton, architects, of Sheffield.

SCHOOL, YORK.—A new Council school, which has been erected on the Poppleton-road, York, to meet the elementary educational requirements of the Poppleton-road and Leeman-

road districts, was opened on the 5th inst. The actual cost of the school, which has places for 1,200 children, has been 21,965*l.* The school is built of plain brick, in the Early Georgian style. The school, out-offices, and yards occupy an area of about 1½ acres. In the school there are nineteen separate classrooms of sixty each, a central hall for the upper school, and marching hall, as well as a gymnasium. Mr. W. H. Brierley, of York, is the architect.

SCHOOL, COWIE.—At Cowie, near Bannockburn, the St. Ninian's School Board have built a new school from the plans of Mr Ronald Walker, Stirling. The building has cost 4,500*l.*, and gives accommodation for 308 pupils.

ROYAL ALBERT MEMORIAL COLLEGE, EXETER.—The Corporation of Exeter have agreed that application shall be made to the Local Government Board for a loan in respect of the proposed additions to the "Royal Albert Memorial College," for which plans, etc., are to be forthwith prepared by Messrs. Tait and Harvey, of Exeter, for the approval of the Board of Education and the Local Government Board.

SOUTHALL-NORWOOD FREE LIBRARY.—The foundation-stone was laid recently of a new library for Southall and Norwood. The Surveyor of the Council, Mr. R. Brown, prepared the plans, and the tender of Messrs. Ferguson and Co., of Tottenham and Carlisle, for the building, was accepted. The building has a frontage of 50 ft. to the road. The entrance to the library will be in the centre of the building, and there will be rooms on either side. The entrance is under three arches. The façade will be faced with Leicester red bricks, with buff terra-cotta dressings, the entrance arches being supported by Corinthian columns. Over the arches will be a terra-cotta panel, with the words "Southall-Norwood Public Library" cast thereon, and above the centre window, on the first floor, will be a terra-cotta panel commemorating the name of the donor of the library (Mr. Carnegie), the whole surrounded by a terra-cotta pediment. The building stands 18 ft. from the roadway, and in front will be ornamental wrought-iron railings. On the right of the entrance there will be a ladies' waiting-room, about 19 ft. by 13 ft. 6 in., and on the left there will be the entrance to the book store and lending library. The reading-room will be 43 ft. long by 25 ft. average width. Leading from the reading-room there will be a reference library, 20 ft. by 23 ft. 6 in. The whole of the floors, with the exception of the entrance hall and lavatory, will be of pitch-pine wood blocks, the hall being laid with mosaic. There will be a lecture hall, 33 ft. square, and a committee-room, the same size as the ladies' waiting-room, on the ground floor. The whole of the building will be heated by hot water. The internal fittings will be of pitch-pine wood.

THE HOTEL METROPOLE, SOUTHEND-ON-SEA.—The new Hotel Metropole, Southend-on-Sea, was opened recently. The building, which has cost upwards of 300,000*l.* to erect, has been built from the plans of Mr. James Thompson, architect. The furnishing has been carried out by Messrs. Goodall, Lamb, and Heighnay, of Manchester, and by Messrs. Oetzmann, of London.

NEW FIRE STATION, KENSINGTON.—The memorial-stone of the new fire station, which is being erected in Clarence-mews, Kensington, was laid a short time ago. The plans for the work have been prepared by Mr. W. E. Riley, Architect to the London County Council, and the contractors are Messrs. Kerridge and Shaw. The total cost, inclusive of site, will be about 19,430*l.*

DRILL HALL, WALLSEND.—A drill hall for the 2nd V.B. Northumberland Fusiliers has been erected at Wallsend. It is 75 ft. by 50 ft., and has cost about 1,750*l.* On the basement there are armoury, clothes-room, sergeants' mess, orderly-room, and stores, while on the first story there are the officers' mess, clothes-room, and stores, together with a balcony overlooking the hall. The building is constructed of red brick and corrugated iron, and ground is in reserve on which to put up a caretaker's house and reading and recreation rooms for the men. Mr. M. H. Graham, of Newcastle, was the architect, and the contract has been carried out by Mr. Weir, of Howdon-on-Tyne.

REFUSE FURNACE, KENSINGTON.—The foundation-stone of the new furnace-house, in Woodlane, Kensington, was recently laid. The work is being carried out by Messrs. Goddard, Massey, and Warner, whose scheme and tender was accepted upon the advice of Mr. William Weaver, the Borough Engineer, and Sir A. R. Binnie. The building will contain twenty furnace cells, having a total cubical capacity of 11,110 ft., capable of dealing with 150 tons of refuse per twenty-four hours, the refuse being carted up inclined planes to tipping platforms on the top of the furnace cells. At the back of the cells storage hoppers, in which refuse awaiting combustion would be placed, will be provided. The chimney shaft will be 156 ft. high. Two steam boilers are to be erected in connexion with the furnaces, each working at a pressure of 160 lbs. to the square inch, from which power will be supplied to machinery for the utilisation of the clinker refuse, and also the necessary heat for the disinfecting apparatus. The cost of the scheme will be 30,513*l.*

APPOINTMENTS.

UNIVERSITY OF LEEDS.—At a meeting of the Council of the University of Leeds on the 10th inst., the Council appointed Dr. George Wilson, A.M.Inst.C.E., to the newly-created Lectureship in Civil Engineering in the University. Dr. Wilson is a graduate in science of the Victoria University, having been a student at Owen's College, where he gained the Ashbury scholarship in engineering. He had two years' experience as a member of the engineering staff of Sir Leader Williams, then chief engineer of the Manchester Ship Canal. He was subsequently appointed demonstrator in the Whitworth laboratory of Owen's College, in which post he has had ten years' experience. In 1902 the Council of the Institution of Civil Engineers awarded him the Telford Premium for experimental work on lateral pressure in sand and its alteration by water.

FOREIGN.

FRANCE.—The architectural department of the Paris Municipality is about to undertake, in co-operation with the Commission des Monuments Historiques, some important works of restoration at the church of St. Gervais. The principal object of the work, which will cost about 135,000 francs, is the repair or rebuilding of the nave buttresses. ——In the crypt of the Madeleine, where some work is going on, has been found the tomb of Vignon, the original architect of the building, which, according to the intention of Napoléon, was to have been a "Temple de la Gloire" and not a church. The tomb was concealed under a pile of stones, and is to be opened out and restored.——The jury in the competition for the "Monument de l'Union Postale Universelle," to be erected at Berne, has chosen from among 122 competitors the design by M. René de Saint-Marceaux. The design shows a group of five female figures, representing the five continents, circling round a terrestrial globe, and passing messages from hand to hand. Below is seated the heraldic image of Berne.——Important works for the improvement of the port of Havre are to be undertaken, at a cost of 3½ million francs.——The General Council of Finisterre has voted a sum of 247,000 francs for the enlargement of the Prefecture of Quimper.——The Chamber of Commerce of Limoges has voted a sum of 240,000 francs for the installation of a "Hôtel des Services."——The jury in the competition for a statue of Jeanne Darc, to be erected at Angers, has declined to recommend any one of the designs for execution, merely awarding premiums to the three best designs.——The Municipal Council of Paris has offered to the town of Riom, the birthplace of Desaix, the statue of the celebrated Republican general which was formerly in the Place Dauphine, and was removed at the alterations made in the Place in 1874. The monument, which is in a rather dilapidated condition, consists of a stele with an inscription, surmounted by a bust of Desaix, which is being crowned by a figure in the dress of a Roman warrior. The general design of the monument is by the architect Percier, the bust and the figure were executed by Fortin. The work is at present in the Art Museum at Auteuil. ——M. Waldeck-Rousseau, whose death has been recently announced, was not only a politician of the first rank, but an enthusiastic lover of painting and sculpture, and enjoyed the regard of many artists, especially of Falguière, of whom he was a faithful friend. He himself possessed great talent as a painter in water-colours.

AUSTRIA.—The monument to the artist Canon, to be erected in Vienna, will soon be completed; the statue is being executed by the sculptor, Professor Weyr.——The new Surgical Hospital, at Vienna, is now in course of construction; the work is to be pushed forward as much as possible, and it is hoped that a portion of the building will be fit for use by January next.——The foundation-stone of the new Catholic church at Zeltweg is to be laid on August 21; the architect is Herr Hans Pascher.

SWITZERLAND.—The Second International Congress for the Promotion of Draughtsmanship was held on August 2, when twenty-one states were represented by over 900 delegates.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Candy and Co., Ltd., have removed their offices and showrooms from Mansion House Chambers, 11, Queen Victoria-street, E.C., to 87, Newman-street, W.

ST. PHILIP'S CHURCH, REGENT-STREET.—Mr. James Green, in his capacity of arbitrator for the claim preferred by Messrs. J. Lyons and Co., against the Ecclesiastical Commissioners, has just made his award in respect of the wine vaults and cellarage beneath the church. The award amounts to 10,409*l.* in respect of the leasehold interest of that company, who claimed about 6,000*l.* more. The church will shortly be pulled down, in pursuance of an Act recently passed in that behalf, for the sale of the site and materials.

SITE OF CHRIST HOSPITAL, LONDON.—The estimated cost of constructing the new street, with sewer and subway, across the new vacant site, is estimated at 45,000*l.*, of which sum the Corporation of the City will contribute 25,000*l.* The ground has been acquired for purposes of the General Post Office, and, in lieu of the projected thoroughfare to relieve the traffic along Newgate-street, steps are being taken for a widening of King Edward-street.

ARBITRATION INQUIRY.—An arbitration inquiry was held at the Surveyors' Institution, Westminster, on the 10th inst., before Mr. E. A. Gruning, sole arbitrator, respecting a claim brought by Messrs. Kirk and Randall against the Office of Works for the balance of money alleged to be due to them under their contract as builders for the erection of the new Post Office Savings Bank at Kensington, which has been in occupation of the department for over a year. Mr. English Harrison, K.C., and Mr. J. A. Scott appeared for the claimants, and Mr. Montague Lush, K.C., and Mr. Askwith represented the Commissioners of Works. A number of legal points were raised as to the interpretation of the contract, but no witnesses were called. At the conclusion of the arguments, which had occupied two days, the arbitrator consented to state a case for the opinion of the High Court.

THE INTERNATIONAL FIRE SERVICE CONGRESS.—The British representation for the International Fire Service Congress, to be held at Budapesth, comprises a special Commission formed by the British Fire Prevention Committee, with Mr. Horace Folker, of the National Fire Brigades' Union, and Mr. Ellis Marsland, District Surveyor, as honorary secretaries. The Commission, besides participating in the Congress at Budapesth, will report on the fire preventive arrangements of Vienna, Munich, Frankfurt, and Cologne. The Commission, which is ten in number, includes:—Mr. Edwin O. Sachs, Chairman of the British Fire Prevention Committee (as chairman of the deputation), and Lieut.-Colonel Fox, Vice-President of the N.F.B.U. The work under consideration at the Congress has special relation to the Baltimore fire, fire prevention in theatres, factories, and mills, to the question of mechanical life-saving ladders and fire alarms. At a meeting of the International Fire Service Council, to be held at the same time as the Congress, the question of universal statistics and other matters will be considered.

THE BATH STONE FIRMS, LTD.—The annual excursion of the employees of the Bath and Wiltshire district of the Bath Stone Firms, Ltd., took place on Saturday last to Plymouth. Three special trains were engaged, and conveyed about 2,000 to the town. Some of the directors and the whole of the office staff accompanied the party.

CANDLER MEMORIAL DRINKING FOUNTAIN, BROCKWELL PARK.—As originally purchased and laid out, Brockwell Park comprised some 56 acres. It was bounded on the Brixton side by 43 acres of building land, and in July, 1899, it became known that this land was in the market. At once a local committee was formed, and ultimately the purchase price was subscribed, and the whole space preserved for the use of the public. This result was largely due to the zeal of Alderman Samuel Horace Candler, the vice-chairman of the Park Extension Committee. At his death it was felt that some memorial of his efforts should be erected in the open space. A fund was opened, and, with Mr. Albert Larking as hon. sec., a drinking fountain was erected at the Water-lane entrance to the park, and this has just been unveiled. The fountain, erected to the designs of Mr. A. W. Sheppard, architect, John-street, Adelphi, is of grey and red granite, capped with York stone, and bears on one panel a bronze portrait medallion of Mr. Candler, and on the other an inscription. The work has been carried out by Mr. J. Whitehead, of Rochester-row, London.

CAPITAL AND LABOUR.

THE YORKSHIRE BUILDING TRADE.—The federated master builders of Yorkshire are anxious to put an end to the possibility of strikes and lock-outs in their trade in the county, and, with this object, have suggested to the men a "closer union scheme." They desire that in future all disputes in the Yorkshire building trades shall be submitted to a Board of Conciliation and Arbitration, the constitution and detailed operations of which they propose shall hereafter be decided upon. In accordance with the wish of these peace-loving employers, the bricklayers, masons, and carpenters and joiners have discussed the "principle of arbitration and conciliation" at their branch meetings, and have taken a vote on the question. The result is to reveal an overwhelming proportion of Yorkshire bricklayers and masons in favour of such a tribunal, while, on the other hand, the members of the Yorkshire branches of the Amalgamated Society of Carpenters and Joiners have expressed their disapproval of the scheme by a majority of 1,595, only 312 voting in its favour, as compared with 1,907 against. Of the seventy branches of this union, a dozen had a majority in support of the idea, these including the largest branch in Sheffield, which voted unanimously in its favour. The eight Leeds branches gave a unanimous vote against. This decision, however, cannot be taken as final, as it is said that the carpenters were misled by an unofficial statement in which it was hinted that one point of the "Closer Union Scheme" would be that trade union carpenters would not be permitted to work for any but employers connected with the Master Builders' Federation. The head officials of the Amalgamated Society of Carpenters and Joiners now recognise that this communication was unofficial, and in their monthly report they say:—We deplore this action because we are convinced that the interests of members can best be promoted by cultivating a closer union between their employers and themselves, and we hope that if the opportunity again offers itself a more liberal view will prevail, and that our society will emerge from the isolated position it now occupies in respect to this question. Now that the air has been cleared, and it has definitely and officially been declared that all details are hereafter to be discussed and determined, the carpenters and joiners of Yorkshire are not likely to lose much time in falling in line with their brother workers in the trade.—*Sheffield Independent.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

13,811 of 1903.—F. G. P. PRESTON and G. C. RALSTON: *Simultaneously-operated, Multiple-cam Devices for Operating and Fixing in Position Bulk-head Doors, and other Doors, Ships' Side Lights, and other Windows, Cylinder Covers, and other Covers.*

This consists in the combination with a door, window cover, or ring, and the frame or part with which it is to make joint, of a number of pivoted cams, means for connecting the cams, and means for simultaneously operating said cams for the purpose of pressing the door tightly against the frame.

17,842 of 1903.—J. J. JACKSON: *Holders or Rope Grips for Elevators, and Conveyors, and Lifts.*

An elevator or conveyor for elevating or conveying grain and other substances or articles, means for connecting the buckets, plates, bars, or other equivalent parts, of the elevator or conveyor, with the ropes or bands, consisting of gripping devices or clamps attached to or formed on the said buckets, plates, bars, or their equivalent parts, comprising a gripping bolt or plug, and a wedge or key arranged to operate in connexion with said bolt or plug.

17,843 of 1903.—J. J. CARTWRIGHT: *Fixed or Portable Cooking and Warming Apparatus.*

A fixed or portable cooking and warming apparatus, wherein solid fuel is burned, consisting in the construction and application of a perforated fire-box, suspended in an air chamber, the supply of air to which is controllable, in combination with a closed and hollow-lined roasting chamber open to the said perforated fire-box.

19,860 of 1903.—E. J. PARRISH: *Means for Supporting Window Sashes, etc.*

Means for supporting window sashes, etc., consisting of a front plate having flanges thereon, a rectangular opening in the upper part of the front plate, corner slots in the lower part thereof, a flattened V-shaped back-plate pivoted at its upper end, bearings at or near the upper end of the rectangular opening for the pivots of the back-plate, a projection upon the front-plate for preventing the pivots of the back-plate jumping their bearings, a roller working in the recess, formed by the back-plate at the rear of the rectangular opening, said back-plate forming a path for said roller, a spring for holding the back-plate up to its work, abutments on the front and back plates for the spring, a bar for tightening the spring working in the corner slots, and a recess in said bar to receive the spring and to prevent the lateral movement of the bar.

20,042 of 1903.—H. PARKER and W. H. BAKER: *Fire Cheek or Fire Brick for Domestic Stoves and Ranges.*

According to this invention, the cheek is formed hollow, with internal baffle-plates or louvres of substantial substance, preferably of a shape approximating to two sides of a triangle, the points of each projection projecting within the groove formed to cause the incoming air to travel in a serpentine course to retard its passage, so that it may be acted upon by passing over the sides of the heated projections, and so become heated before its exit. Near the top of the cheek is a lateral opening to deflect the air over top of oven or boiler. When in position the bottom of cheek is open for inlet of air from ash-pit.

20,421 of 1903.—F. HOWETT: *Manufacture of Artificial Stone.*

This invention relates to the manufacture of artificial stone, and more particularly to the manufacture of such stone slabs and other articles from refuse destructor ashes. The invention consists in treating the refuse destructor ashes with a chemical solution which will render the sulphur contained in the ashes incapable of having any injurious effects on the cement employed in the manufacture of the artificial stone. In the manufacture of artificial stone, according to this invention, the refuse ashes and clinker, after being broken up, but before being mixed with the cement and other well-known ingredients, are thoroughly well washed with a solution of chloride of calcium and soda or potash.

229 of 1904.—E. HURN: *Method of Circulating Hot and Cold Water by Power.*

This invention consists of an internal or external screw inserted in a pipe, worked by power, whereby the circulation of water is accelerated, and all difficulties of circulation overcome. Its operation is as follows:—A revolving screw is inserted in the floe pipe immediately over the boiler or circulator. This screw is worked by belt and pulleys, driven either by motor, gas engine, or steam power. The high speed of this screw causes a greatly accelerated circulation of the water. It also overcomes the balance of power, thus surmounting all dips, in the circulation, thereby enabling any building to be warmed as easily with boiler placed in the roof as in the basement.

1,649 of 1904.—W. BALS: *Door Locks.*

A device for preventing accidental opening of door locks, comprising in its construction a star-wheel with several teeth, fixed to the stationary door wing or door post, and a spring-actuated retaining pawl for the star-wheel, in combination with a specially-shaped door latch.

2,771 of 1904.—J. FIDDIS and J. F. WATT: *Sprinklers for Extinguishing Fire.*

A fire sprinkler, consisting in the combination with a water pipe having a discharge outlet, of a friable bulb or dome normally closing said outlet, means for fracturing said dome, devices for normally supporting said fracturing means, but automatically releasing the same on abnormal rise of temperature.

8,460 of 1904.—A. URMACHER: *Frames for Concrete Building, and other purposes.*

This relates to a boarding frame for the manufacture of beton structures, the essential feature of which is that, by means of vertical and horizontal bars, united by tubes and pegs, there is formed a frame divided into squares which are lined with short boards of a uniform size, the boards being held or locked together by U-irons and handles, but may be removed without interfering with the frame.

9,944 of 1904.—F. J. M. M. DUCASTEL: *An Agglutinant or Cement, and Method of Manufacturing the same.*

A process for manufacturing an agglutinant intended to replace lime and cement in all their applications, which consists in the treatment with heat in a rotary furnace provided internally with rollers, on the one hand of a preparation of lime or cement, and on the other hand of a given but variable quantity of silicate, silicates, or even carbonates, these materials being crushed separately and mixed at the moment of their entrance into the said furnace, where, in a state of extreme sub-division, they are subjected to the action of gas.

10,238 of 1904.—E. C. MAHONY: *Portable Wall Sections for House-building.*

A knock-down house, consisting in the construction of its walls in portable sections, each comprising a basic frame on the outer side of which is a covering of weather boarding on a sheathing of impermeable material, and on the other side of the frame a wall lining of interior finishing, with an intervening air space between the outer and inner lining, and means for bonding such sections to one another to the house foundation sill, and to the roof structure.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 3.—By R. F. CONDER (at Biggleswade).
Langford, Beds.—Freehold allotment lands, 44 a. 0 r. 10 p. £1,790

August 4.—By HAMPTON & SONS (at Haslemere).
Bramshot, etc., Hants.—Outlying portions of the Hewshott Estate, 66 a. 0 r. 33 p., f... 5,680

August 5.—By FENN & Co. (at Chelmsford).
Great Baddow, Essex.—"Pitt-pl." and 7 a. 0 r. 28 p., f., p. 2,100

August 6.—By FENN & Co. (at Colchester).
Wakes, Colne, etc., Essex.—"Crepping Hall Estate," 201 a. 3 r. 13 p., f..... 2,900

August 9.—PERCY H. CLARKE.
Brixton.—24 and 26, Tindal-st., u.t. 56 yrs., g.r. 8*l.*, w.r. 65*l.* 420
45, Langton-rd., u.t. 51½ yrs., g.r. 4*l.* 10s., w.r. 36*l.* 8s. 215
55 and 57, St. Lawrence-rd., u.t. 59 yrs., g.r. 8*l.* 8s., y.r. 60*l.* 520
Camberwell.—41, Cambridge-st., u.t. 46 yrs., g.r. 3*l.*, w.r. 29*l.* 18s. 200
43 to 53 (odd), Cambridge-st., u.t. 48 yrs., g.r. 12*l.*, w.r. 170*l.* 6s. 1,050
86 and 88, Cambridge-st., u.t. 46 yrs., g.r. 6*l.*, w.r. 72*l.* 16s. 440
Hammersmith.—35 and 36, Wilson's rd., u.t. 52½ yrs., g.r. 5s. 5d., w.r. 57*l.* 4s. 400

By H. N. NEWTON & Co.
Hampton Wick, Middlesex.—23, 24, and 25, High-st., f., y.r. 88*l.* 1,750

By SEDGWICK, SON, & WEALL (at Watford).
Watford.—1A, 2, and 2B, Nascot-st., f. 1,355

August 11.—By NEWBON, EDWARDS, & SHEPHARD.
Notting Hill.—St. Mark's-rd., l.g. rents 40*l.*, u.t. 60 yrs., g.r. 4*l.* 6s. 615
Hackney.—King Edward-rd., etc., l.g. rents 129*l.*, u.t. 35 yrs., g.r. 4*l.* 1,800
King Edward-rd., l.g. rents 131*l.* 10s., u.t. 35, g.r. 1*l.* 15s. 1,835
Shore-rd., l.g. rents 41*l.*, u.t. 27 yrs., g.r. 2*l.* 470
Stoke Newington.—21, Jenner-rd., u.t. 69½ yrs., g.r. 6*l.*, y.r. 36*l.* 390
Islington.—23, Baxter-rd., u.t. 55½ yrs., g.r. 5*l.* 5s., y.r. 32*l.* 275
19, Norfolk-rd., u.t. 55½ yrs., g.r. 5*l.*, e.r. 32*l.* 270
Hoxton.—93, Herbert-rd., u.t. 38 yrs., g.r. 7*l.* 7s., e.r. 65*l.* 465
King's Cross.—36, All Saint's-st., u.t. 41 yrs., g.r. 12*l.*, y.r. 79*l.* 4s. 275
Finchley.—51 and 53, Lincoln-rd., u.t. 79 yrs., g.r. 12*l.* 10s., y.r. and e.r. 68*l.* 560

By STIMSON & SONS.
Charlton.—493, 495, 497, and 499, Woolwich-rd., u.t. 86 yrs., g.r. 14*l.* 4s., w.r. 122*l.* 4s. 730
Clapham.—20, Park-hill, u.t. 38 yrs., g.r. 15*l.*, e.r. 75*l.* 550
Fulham.—590, King's-rd., u.t. 46½ yrs., g.r. 6*l.*, e.r. 55*l.* 400
New Cross.—170 to 184 (even), Edward-st., u.t. 40 yrs., g.r. 16*l.* 8s., w.r. 231*l.* 8s... 1,760

By WILLIS, CROUCH, & LEE.
Clapton.—1 and 5, Ganden-rd., u.t. 58 yrs., g.r. 15*l.*, y.r. 95*l.* 830
Hampstead.—40, 42, and 46, Denington Park-rd., u.t. 77 yrs., g.r. 31*l.* 10s., y.r. 173*l.*... 1,150

By A. C. NICHOLSON, with STANFORD & BROWN (at Oswestry).
Llansilin, Denbighshire.—"Moelygwelltyn Farm," 82 a. 1 r. 23 p., f..... 1,380
"Moelfae Farm," 270 a. 1 r. 15 p., f..... 3,750

August 12.—By TYSER, GREENWOOD, & CRIER.
Gunnersbury.—3 and 5, Harvard-rd., u.t. 72 yrs., g.r. 30*l.*, y.r. 100*l.* 915

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

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MEETINGS.

SATURDAY, AUGUST 20.

Northern Architectural Association.—Visit to Sunderland.

OCTOBER 6 and 8.

Visit of the Royal Institute of British Architects to Newcastle-upon-Tyne.—The following, amongst other arrangements, are being made in connexion with the visit of the Institute to Newcastle: The Northern Architectural Association Reception Committee will receive the visiting members of the Institute at the County Hotel, at 9.0 p.m., on October 6th. His Worship the Mayor of Newcastle will receive the members at 10.0 a.m., on October 7th. After which, about an hour will be devoted to the reading and discussion of a paper on "Specialism in Architecture." The President of the R.I.B.A. will take the Chair. The Cathedral and the Trinity House will be visited. The Northern Architectural Association will entertain the visiting members at luncheon at the County Hotel, Neville-street, at 1.0 p.m. Arrangements will be made for those members, who wish to do so, to visit during the afternoon of Friday, places of interest in the immediate neighbourhood. In the evening a dinner will be held, and on Saturday, October 8th, arrangements will be made for those who desire to do so, to visit Hexham Abbey and the Roman Station at the Chesters, Chollerford, etc.; also the New Shipbuilding Sheds at Messrs. Swan & Hunter's, Wallsend.

TO CORRESPONDENTS.

H. M. T.—F. C. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	16	0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1	13	0	" " "
Facing Stocks	2	12	0	" " "
Shippers	2	10	0	" " "
Fletton	1	10	0	" " "
Red Wire Cuts	1	13	0	" at railway depôt.
Best Fareham Red	3	12	0	" " "
Best Red Pressed Ruabon Facing	5	0	0	" " "
Best Blue Pressed Staffordshire	4	4	0	
Do. Bullnose	4	10	0	" " "
Best Stourbridge Fire Bricks	4	8	0	" " "
GLAZED BRICKS. Best White and Ivory Glazed Stretchers	13	0	0	
Headers	12	0	0	" " "
Quoins, Bullnose, and Flats	17	0	0	" " "
Double Stretchers	19	0	0	" " "
Double Headers	16	0	0	" " "
One Side and two Ends	19	0	0	" " "
Two Sides and one End	20	0	0	" " "
Splays, Chamferred, Squints	20	0	0	" " "
Best Dipped Salt Glazed Stretchers, and Header Quoins, Bullnose, and Flats	12	0	0	" " "
Double Stretchers	14	0	0	
Double Headers	15	0	0	" " "
One Side and two Ends	14	0	0	" " "
Two Sides and one End	15	0	0	" " "
Splays, Chamferred, Squints	15	0	0	" " "
Second Quality White and Dipped Salt Glazed	14	0	0	" " "
	2	0	0	" less than best.

BRICKS, &c.—(*continued*).

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	" "
Best Portland Cement	30	0	per ton, "
Best Ground Blue Lias Lime	21	0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	" "

	s.	d.		
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.	
Beer "	1	6	"	"
Greenshill "	1	10	"	"
Darley Dale in blocks	2	4	"	"
Red Corsehill "	2	5	"	"
Closeburn Red Freestone	2	0	"	"
Red Mansfield "	2	4	"	"
YORK STONE—*Robin Hood Quality.*				
Scappled random blocks	2	10	"	"
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super.	"
6 in. rubbed two sides ditto, ditto	2	6	"	"
3 in. sawn two sides slabs (random sizes)	0	11½	"	"
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	"	"
1½ in. to 2 in. ditto, ditto	0	6	"	"
HARD YORK—				
Scappled random blocks	3	0	per ft. cube,	"
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super.	"
6 in. rubbed two sides ditto	3	0	"	"
3 in. sawn two sides (slabs random sizes)	1	2	"	"
2 in. self-faced random flags	0	5	"	"
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt.	
" " " 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.	
" " " 3 in. do.	1	2½	" "	

SLATES.

in.	in.		£	s.	d.	
20 × 10	best blue Bangor		13	2	6	per 1000 (of 120) at r. d.
20 × 12	"	"	13	17	6	" "
20 × 10	first quality	"	13	0	0	" "
20 × 12	"	" "	13	15	0	" "
16 × 8	"	" "	7	5	0	" "
20 × 10	best blue Portmadoc		12	12	6	" "
16 × 8	"	"	6	12	6	" "
20 × 10	best Eureka unfading green		15	17	6	" "
20 × 12	"	"	18	7	6	" "
18 × 10	"	"	13	5	0	" "
16 × 8	"	"	10	5	0	" "
20 × 10	permanent green		11	12	6	" "
18 × 10	"	"	9	12	6	" "
16 × 8	"	"	6	12	6	" "

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. " "
Best Broseley tiles	50	0	per 1000 " "
Do. Ornamental tiles	32	6	" " "
Hip and Valley tiles	4	0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 " "
Do. Ornamental do	60	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	0	" " "
Best Red or Mottled Stafford shire do. (Peakes)	51	9	per 1000 " "
Do. Ornamental do	54	6	" " "
Hip tiles	4	1	per doz. " "
Valley tiles	3	8	" " "
Best "Rosemary" brand plain tiles	48	0	per 1000 " "
Best Ornamental tiles	50	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	8	" " "
Best "Hartshill" brand plain tiles, sand faced	50	0	per 1000 " "
Do. pressed	47	6	" " "
Do. Ornamental do	50	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	6	" " "

WOOD. At per standard.

	£	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15	10	0	16	10	0
Deals: best 3 by 4	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	" " "		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0		9	10 0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0		9	10 0

WOOD (*continued*). At per standard.

	£	s.	d.	£	s.	d.
Foreign Sawn Boards—1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	"		
	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0

JOINERS' WOOD. At per standard.

	£	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in	23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in	18	10	0	20	0	0
" " 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14	10	0	15	10	0
" " 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
" " 3 in. by 9 in.	12	10	0	13	10	0
" " battens	9	10	0	10	10	0
Pitch-pine: deals	16	10	0	20	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	40	0	0	upwards.		
Oddments	28	0	0	"		
Seconds, regular sizes	30	0	0	"		
Yellow Pine oddments	25	0	0	"		
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	2	6	0	3	6
Small " "	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube.	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	9
¾ in. do. do.	0	0	7	—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	1	0
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks, per ft. cube	0	4	0	—		
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. do. do.	0	14	0	0	18	0
¾ in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	11	6	0	13	6
6 in. at 6d. to 9d. per square less than 7 in.						

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.					
	£	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0 ...	7	5	0
Compound Girders, ordinary sections	8	2	6 ...	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6 ...	8	17	0
Flitch Plates	8	5	0 ...	8	15	0
Cast Iron Columns and Stanchions including ordinary patterns	7	2	6 ...	8	5	0

METALS. Per ton, in London.

	£	s.	d.	£	s.	d.
IRON—						
Common Bars	7	5	0 ...	7	15	0
Staffordshire Crown Bars, good merchant quality	7	15	0 ...	8	5	0
Staffordshire "Marked Bars"	10	0	0 ...	—		
Mild Steel Bars	8	15	0 ...	9	5	0
Hoop Iron, basis price	9	5	0 ...	9	10	0
" " Galvanized	17	10	0 ...	—		
("And upwards, according to size and gauge.)						
Sheet Iron, Black— Ordinary sizes to 20 g.	9	15	0 ...	—		
" " 24 g.	10	15	0 ...	—		
" " 26 g.	12	5	0 ...	—		
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	15	0 ...	—		
Ordinary sizes to 22 g. and 24 g.	13	5	0 ...	—		
" " 26 g.	14	5	0 ...	—		
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16	0	0 ...	—		
" " 22 g. and 24 g.	16	10	0 ...	—		
" " 26 g.	18	0	0 ...	—		
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	12	10	0 ...	—		
" " 22 g. and 24 g.	13	0	0 ...	—		
" " 26 g.	13	15	0 ...	—		

PRICES CURRENT.—*Continued on page 215.*

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Stables, etc., Boulevard, Hull	.....	Gelder & Kitchen, Architects, 76, Lowgate, Hull	Aug. 18
350 Tons of Cast-Iron Pipes, etc.	Southport, etc., Water Board	H. Rofe & Son, 8, Victoria-street, Westminster	Aug. 19
Pipe Sewers for Mytholmes Outfall	Haworth U.D.C.	W. B. Woodhead & Sons, Engineers, 18, Exchange, Bradford	do.
Painting, etc., Children's Hospital, Firvale	Sheffield Guardians	A. E. Booker, Clerk, Union Offices, Westbar, Sheffield	Aug. 20
Alteration, Co-op. Soc. Premises, 103, Fore-st., Saltash	.....	Secretary, 113, Fore-street, Saltash	do.
School, Firs Hill, Sheffield	Education Committee	J. R. Wigfull, A.R.I.B.A., 14, Parade-chmbrs., East-pa., Sheffield	do.
Trench Work, Canniesburn Toll and Kilbowie	Glasgow Corporation Gas Dept.	A. Wilson, Engineer, 45, John-street, Glasgow	do.
Paving Street	Manchester Corporation	Paving, etc., Dept. (Surveyor's Office), Town Hall, Manchester	Aug. 22
Alterations and Additions to Sick Wards at Wkhse.	Ledbury Guardians	R. Homes, Board Room, Workhouse, Ledbury	do.
Two Iron Exit Staircases	do.	do.	do.
Electric Light Installation	Batley Working Men's Club	W. Booth, Secretary	do.
Two Semi-detached Villas, Pontypridd	.....	J. Gabriel, Trallwn Bridge, Pontypridd	do.
Cloakrooms, Hume-street and Mill-lane Schools	Stockton Education Committee	M. H. Sykes, Borough Engineer, Town Hall, Stockton-on-Tees	do.
Alterations, etc., Troedyrhiwfuwch Inn, Gelligaer	Mrs. Morgan	At the Inn	Aug. 23
Emptying Wells	Felixstowe and Walton U.D.C.	H. Clegg, Surveyor, Town Hall, Felixstowe	do.
Painting Asylum Buildings, Blackadon, Ivybridge	Plymouth Asylum Visiting Comttee.	C. Lintern, Clerk, Blackadon, Ivybridge	do.
Waterproof Solution for Walls of Asylum Buildings	do.	do.	do.
Converting the Willows in Green Bat into Shop, etc.	H. T. Purvis & Son	J. Wightman Douglas, 1, St. Nicholas-buildings, Newcastle-on-Tyne	do.
*Fireproof Floor to Switch-board Gallery	Ashton-under-Lyne Corporation	Borough Electrical Engineer, Ashton-under-Lyne	do.
Electrical Works at Workhouse Premises	Stoke-upon-Trent Guardians	C. Daniel, Clerk, Union Offices, Stoke-upon-Trent	Aug. 24
Manse, Minister of Dallas	.....	J. Wittet, Architect, Elgin	do.
Sewerage, Eden Village	Larne R.D.C.	J. W. Whiteford, B.E., Atlantic-buildings, 28, Waring-street, Belfast	do.
Sewerage Works, North-road Railway Bridge	do.	do.	do.
45,000 Bricks	Chesterfield R.D.C.	Colin Clegg, Engineer, Ramsley Lodge, Baslow, near Chesterfield	Aug. 25
565 Tons of Lump Chalk	do.	do.	do.
943 Tons of Fine Sand	do.	do.	do.
Committee Room, Victoria Hall, Rhymney	The Directors	G. Kenshole, Architect, Station-road, Bargoed	do.
Painting and Renovating Hall	do.	do.	do.
Extensions, etc., Williams Endowed Schools, Caerleon	The Governors	Lansdowne & Griggs, Archs., Metropolitan Bank-chamb'rs, Newport	do.
Corrugated Iron Sheds at Back of Eastern Wharf	Dundee Harbour Trustees	J. Thompson, Harbour Engineer, Dundee	do.
Painting, etc., Pendleton Town Hall	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
400,000 Jarrah Wood Sleepers	Crown Agents for Colonies	Office of Crown Agents, Whitehall-gardens, S.W.	do.
Laying 220 yds. 9-in. Sewer at Kirklands	Baildon U.D.C.	J. Bentley, Clerk, Council Offices, Baildon	do.
Storage Reservoir on Finlay Burn, Luss	W. Dist. Commtt., Dumbarton C.C.	Babtie & Bonn, Engineers, 180, Hope-street, Glasgow	Aug. 26
1¼ miles 15-in. Fire Clay Conduit	do.	do.	do.
Five miles 15-in. Cast-Iron Conduit	do.	do.	do.
Aluminium Badges	Glasgow Corporation	Registrar of Police, 74, Bell-street, Glasgow	do.
Cottage, Fochabers	W. A. & G. Baxter	J. Wittet, Architect, Elgin	do.
Alterations, etc., Rathcoole Dispensary	Celbridge Guardians	F. Shortt, Clerk, Board Room, Celbridge, Ireland	do.
Outside Paintg., County Asyl., Whittingham, Preston	.....	At the Asylum	Aug. 27
Infant School, Garndiffaith, near Pontypool	Trevethin School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Alterations to Infant School	do.	do.	do.
*Electric Light Installation, Plumstead Common	Royal Arsenal Co-operative Society	F. Bethell, 23, Queen Anne's-place, Bush Hill-park, Enfield, N.	do.
Adapting "Grey Friars" Building to Museum	Lincoln Corporation	W. Watkins & Son, Architects, Lincoln	Aug. 29
Sludge Tanks & Press Ho., Sewage Wks., Salterhebble	Halifax Highways Committee	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Boundary Walls, Drainage, etc., adj. Newport Cemetery	Newport (I. of Wight) Burial Board	Stratton & Millgate, Architects, 21, Quay-street, Newport	do.
240 lineal yds. of Unclimbable Fencing	Clayton-le-Moors U.D.C.	A. Dodgeon, Surveyor, Clayton-le-Moors	do.
400 yds. 18-in. C.-I. Pipes, etc., Dagenham Sewage Wks.	Romford R.D.C.	J. Simmons, Engineer, Bank-chambers, Doncaster	do.
2,700 yds. Pipe Sewers, etc., Rainham	do.	do.	do.
Pumping Station and Machinery	do.	do.	do.
1,200 yds. 7-in. Cast-Iron Rising Mains	do.	do.	do.
Outfall Works and Tanks and Filters	do.	do.	do.
Laying-Out Six Acres of Land, Rainham	do.	do.	do.
Work and Fittings at Workhouse	Alverstoke Guardians	H. A. F. Smith, Architect, Star-chambers, High-street, Gosport	do.
Club Premises	Pelaw, Wardley, & Bill Quay Club Co.	Vaux & Mark, Architects, 66, John-street, Sunderland	do.
Holiness Church & Minister's House, Tadman-st., Hull	.....	Melville Lenham, Architect, etc., 24, John-st., Kingston-square, Hull	do.
9,000 Perforated Drain Covers, Davyhulme Sew. Wks.	Manchester Corporation	Secretary of Rivers Department, Town Hall, Manchester	do.
Workman's Hall and Institute, Ynishir	Standard Colliery Workmen's Com.	E. Williams, Architect, Andrew's-buildings, Cardiff	do.
Alterations to Wesleyan Calvinistic Methodist Chapel	Rev. D. M. Thomas	Miss Howard, near Chapel	do.
*Erection of Library, Prince Regent's-la., Custom House	County Borough of West Ham	Borough Engineer, Town Hall, Stratford, E.	do.
*Chapel and Vestries at Christ Church, Wolverhampton	.....	Fleeming & Son, Architects, 10, Queen-square, Wolverhampton	do.
Pumping Machinery	Swinton U.D.C.	R. Fowler, Engineer, Council Offices, Swinton, near Rotherham	Aug. 30
Improvement Works, Spener-street	Bootle Corporation	Borough Engineer's Office, Bootle	do.
Water Tank at Workhouse, Linton	Linton Guardians	W. Richardson, Clerk, Linton	do.
*Hot-water Heating System, Plumstead Common	Royal Arsenal Co-operative Society	F. Bethell, 23, Queen Anne's-place, Bush Hill-park, Enfield, N.	do.
Country H'se, etc., Higher Trerose, Helford R., Mawnan	H. Coode	B. C. Andrew, Architect, Biddick's-court, St. Austell	Aug. 31
Clinker Brickmaking Plant	West Hartlepool Corporation	N. F. Dennis, Borough Engineer, West Hartlepool	do.
Unclimbable Iron Railings	Audenshaw U.D.C.	W. Clough, Engineer, 2, Guide-lane, Audenshaw	do.
Presbyterian Church, Ravenhill-road, Belfast	.....	S. C. Hunter, Scottish Provident-buildings, Belfast	do.
School and Teacher's House at Welwick	East Riding Education Committee	The Clerk of Works, Beverley	do.
*Filter Beds at Sewage Works	Kingston-on-Thames Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames	do.
*Alterations to Darenth Asylum, Dartford	Metropolitan Asylums Board	Offices of the Board, Embankment, E.C.	do.
*Erection of Wood Fencing, Highwood Schl., Brentwood	do.	do.	do.
*Erection of Workshops, etc., do.	do.	do.	do.
Repaving Bury New-road	Prestwich U.D.C.	Surveyor's Office, Chester Bank, Prestwich	Sept. 1
Foundations, etc., Avonmouth Electricity Works	Bristol Electrical Committee	H. Faraday Proctor, City Electrical Engineer, Temple Back, Bristol	do.
Surface-water Drains and Gullies, Yardley	Worcestershire County Council	A. E. Brookes, Breedon Cross, King's Norton	do.
A Cornish Boiler at Union Workhouse	Tavistock Guardians	J. D. Johnstone, 1, Church-lane, Tavistock	Sept. 2
Furniture, Fixtures, & Fittings, Wkhse. Din'g Hall, etc.	Richmond Guardians	P. Umney, Clerk, Union-chambers, Richmond, Surrey	do.
Six miles of Stormwater Sewers, etc.	Handsworth U.D.C.	H. Richardson, Engineer, Council House, Handsworth	do.
11¼ miles of Cast-Iron Pipes, etc., Coed Paton	Brymbo Water Co.	H. Dennis, Engineer, Ruabon	Sept. 3
Valves, Hydrants, Meters, etc.	do.	do.	do.
Haulage from Coed Paton	do.	do.	do.
Cutting and Filling 11¼ miles	do.	do.	do.
Street Works	Houghton-le-Spring U.D.C.	J. W. Holbrook, Surveyor to Council, Houghton-le-Spring	do.
Scavenging, Hurworth	Darlington R.D.C.	J. Robinson, Union Offices, Darlington	do.
Pumping Station Buildings, Water Tower, etc.	Bicester U.D.C.	E. F. Tanner, Clerk, Bicester	Sept. 5
Distribution Mains	do.	do.	do.
2,000 Tons of Broken Granite	Hitchin U.D.C.	W. O. Times, Clerk, Town Hall, Hitchin	do.
400 Tons of 2-in. and 1½-in. Broken Ironstone Slag	do.	do.	do.
*Library, Public Offices, and Assembly Hall	Ilkley U.D.C.	W. Bakewell, Architect, 38, Park-square, Leeds	do.
Reconstruction of Horse Tramways	West Ham Corporation	J. E. Waller, Engineer, 29, Great George-street, Westminster	Sept. 7
Heating Workhouse, Plumstead	Woolwich Guardians	T. Cutter, Clerk, 30, Rectory-place, Woolwich	do.
Receiving Wards at Workhouse, Woodbridge-road	Ipswich Guardians	Brown & Burgess, Architects, Princes-street, Ipswich	Sept. 8
School for 400 at Penygraig	Rhondda U.D.C. Education Com.	J. Rees, Architect, Hillside Cottage, Pentre	do.
*New Coastguard Buildings at Hove	Admiralty	Superintending Engineer, H.M. Dockyard, Portsmouth	Sept. 9
*New Coastguard Buildings at Barrow-in-Furness	do.	Director of Works Dept., Admiralty, 21, Northumberland-ave, W.C.	do.
*New Coastguard Buildings at Fifeness	do.	Supt. Engr., H.M. Naval Estb., Rosyth, near Inverkeithing, N.B.	do.
Chimney Shaft at Electric Light Station	Torquay Town Council	H. A. Garrett, Borough Engineer, Town Hall Chambers, Torquay	Sept. 12
*Public Library	Hanwell U.D.C.	Council's Clerk, Hanwell, W.	do.
*Erection of Chimney Shaft	Torquay Town Council	Borough Engineer, Town Hall-chambers, Torquay	do.
*Sewage Disposal Works	Hanwell U.D.C.	Council's Surveyor, Council Offices, Hanwell, W.	do.
*Erection of New Northern Dis. Post Office, Liverpool	H.M. Office of Works	H.M. Office of Works, Storey's-gate, Westminster, S.W.	do.
Railway and Bridge over the Wear at Sunderland	N.E. Railway Co.	C. A. Harrison, Engineer, Central Station, Newcastle-on-Tyne	Sept. 13
*Overground Convenience at Cemetery, Tooting, S.W.	Lambeth Borough Council	Borough Engineer, 346, Kennington-road, S.E.	Sept. 14
Chapel, Cwmbran, R.S.O., Mon.	Penywain Congregational Church	W. T. Phillips, Emporium-buildings, Cwmbran	Sept. 15
Enlargement of Knowle Council School	Bristol Education Committee	P. Addie, City Valuer, Council House, Bristol	Sept. 18
Red Fir Telegraph Poles	Postmaster General	S. C. Hooley, Stores Department, G.P.O., 17 & 19, Bedford-st., W.C.	Sept. 22
Creosoting Poles	do.	do.	Sept. 26
			do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Primitive Method. College, Alexandra-rd., Manchester	.....	F. W. Dixon, Architect, Trevelyan-buildings, Manchester	No date.
Completion, Handysides-arcade, Percy-st., Newcastle	Exors. late G. Handyside	J. W. Dyson, Architect, 67, Grey-street, Newcastle-on-Tyne	do.
New Street, Wilmington	G. & T. Earle, Ltd.	Brodrick, Lowther, & Walker, Architects, 77, Lowgate, Hull....	do.
Pulig. Down Fourteen Houses, Barker-st., Shrewsbury	.....	W. Richards, Surveyor, Swan-hill, Shrewsbury	do.
Alterations to Premises, High-street, Winchester ..	Messrs. Hillier & Sons	Colson, Farrow, & Nisbett, Architects, 45, Jewry-street, Winchester	do.
Fitting Shop Windows, Bridge-street, Bradford	Bradford Mechanics' Institute	E. W. Roberts, Secretary	do.
School, Wingrove	Newc.-on-Tyne Education Committ.	C. Walker, Architect, Eldon-square, Newcastle-on-Tyne	do.
Asphalting Playground, S. Kirkby New Schools	.....	T. H. Richardson, Architect, Hemsworth.....	do.
Sink. Sh'ft, Middleton Main Seam, Wrenthorpe Colliery	.....	Low Laithes Colliery, Ossett	do.
7-in. Grit Setts, 3-in. Flags; also Kerbs and Edgings	.....	C. Booth, Randal-street, Bolton.....	do.
*Erection & Laying-out of Permanent Showyard, Elgin	Morayshire Farmer Club.....	W. Rox Black, Town and County Bank-buildings, Elgin.....	do.
*Erection of 24-Bed Isolation Hospital in Honey-lane	Waltham Joint Hospital Board....	Office of the Board, Embankment, E.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Architectural Assistant	Barrow-in-Furness Corporation	120*l*.....	Aug. 22
*Quantity Surveyor	Surrey Education Committee.....	See advertisement in this issue	do.
*Sanitary Inspector	Bermondsey Borough Council	130*l*.....	Sept. 6

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xvi. xvii.

PRICES CURRENT.—*Continued from page 212.*

METALS (*continued*).	Per ton, in London £ s. d.				£ s. d.
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	15	0	...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12	15	0	...	—
" " " 26 g.....	14	0	0	...	—
Cut nails, 3 in. to 6 in.....	9	0	0	...	9 10 0
(Under 3 in., usual trade extras.)					

LEAD, &c.	Per ton, in London. £ s. d.				£ s. d.
Lead—Sheet, English, 3lb. and up	14	7	6	...	—
Pipe in coils	14	17	6	...	—
Soil pipe	17	7	6	...	—
Compo pipe.....	17	7	6	...	—
Zinc—Sheet—					
Vieille Montagne .....ton	27	0	0	...	—
Silesian.....	26	15	0	...	—
Copper—					
Strong Sheet.....per lb.	0	0	10	...	—
Thin " ..... "	0	0	11	...	—
Copper nails ..... "	0	0	10	...	—
Brass—					
Strong Sheet..... "	0	0	9½	...	—
Thin " ..... "	0	0	10	...	—
Tin—English Ingots ..... "	0	1	3½	...	—
Solder—Plumbers' ..... "	0	0	6½	...	—
Tinmen's..... "	0	0	8	...	—
Blowpipe..... "	0	0	9	...	—

ENGLISH SHEET GLASS IN CRATES.	
15 oz. thirds	2½d. per ft. delivered.
" fourths.....	1½d. " "
21 oz. thirds	3½d. " "
" fourths.....	2½d. " "
26 oz. thirds	4d. " "
" fourths.....	3½d. " "
32 oz. thirds	5d. " "
" fourths.....	4½d. " "
Fluted Sheet, 15 oz.....	3d. " "
" 21 oz.....	4d. " "
½ Hartley's Rolled Plate	1½d. " "
¾ " " "	1½d. " "
1 " " "	2½d. " "

OILS, &c.		£ s. d.
Raw Linseed Oil in pipes.....	per gallon	0 1 7
" " " in barrels	"	0 1 8
" " " in drums	"	0 1 10
Boiled " " in pipes	"	0 1 9
" " " in barrels.....	"	0 1 10
" " " in drums	"	0 2 0
Turpentine, in barrels	"	0 3 6
" in drums	"	0 3 8
Genuine Ground English White Lead	per ton	18 15 0
Red Lead, Dry.....	"	18 10 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar.....	per barrel	1 12 0

VARNISHES, &c.	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak.....	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage.....	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan.....	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l*., unless in some exceptional cases and for special reasons.]

*** Denotes *accepted*. † Denotes *provisionally accepted*.**

AMBLE (Northumberland).—For 960 yds. of random whin chip paving in Newburgh and Bridge-street back lanes, for the Urban District Council. Mr. W. Gibson, Surveyor, Amble:—

	s. d.
Paving: R. Scott, Amble*	2 8

BISHOP AUCKLAND.—For erecting cottage homes, and for other work, for the Guardians. Mr. C. Johnston, architect and surveyor, Cockton Hill, Bishop Auckland. Quantities by Mr. George Bell, Newcastle-on-Tyne:—

T. Atkinson ..	£6,506 14	T. Hilton	£5,586 0
Walton Bros. ..	5,893 0	G. H. Bell	5,578 11
T. Manners	5,598 19		

BUSHEY (Herts).—For the drainage and rearrangement of playground, and for erection of playshed, for the Managers of the Boys' British School. Mr. W. H. Syme, architect, 4, High-street, Watford:—

G. R. Mann ..	£595 8 5	G. Wiggs	£510 0 0
H. Pitkin	536 12 3	W. A. Jones ..	493 0 0
W. & D. Wilkins	527 0 0	J. Tyler, Watford*	483 0 0
F. P. Bliss	512 0 0		

COWPEN.—For making-up Thompson-street, etc., for the Urban District Council. Mr. R. Grieves, Surveyor to Council:—

G. E. Simpson & Co.	£872 14 0	J. Robson, Newcastle-on-Tyne*	£692 5 6
W. Proudlock & Co.	861 15 4	J. Shannon....	691 15 6
McLaren & Co.	707 13 9		

GRAIG-Y-FEDW.—For erecting thirty semi-detached houses at Graig-y-fedw, near Abertridwr, for the Trustees of the Graig Building Club. Mr. G. L. Watkins, architect, Station-terrace, Caerphilly:—

T. F. Howells....	£225 0	Hamilton & Millard	£217 0
Passmore & Perkins.....	218 0	R. Jones, Aber*..	216 10
		A. Herne & Co...	215 0

HOVE.—For paving works, etc., Cambridge-road, Conway-street, and Lansdowne-place, for the Corporation. Mr. H. H. Scott, Borough Surveyor, Town Hall, Hove:—

W. Whiteman, 59, Clarendon-villas Hove.... £507

ILFORD.—For paving Ley-street, from Cranbrook-road to Vicarage-lane, for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford:—

Parsons & Parsons, Wharf, Ilford £4,915

ILFORD.—For 315 yds. of oak fencing and one pair of gates in Tanner's-lane, Barkingside, for the Urban District Council. Mr. H. Shaw, Surveyor, Public Offices, Ilford:—

Langdon & Clark, 3, Grosvenor-road, Ilford.. £239

ILFORD.—For road works, Park-lane, Chadwell, for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford:—

B. W. Glenny, Consingle, Romford .. £354 10 6

KELSO.—For laying main water pipes and construction of reservoir, for the Kelso District Committee. Mr. John Smith, Sanitary Inspector, Newtown, Gt. Boswells:—

A. R. Burns, Kelso* £494

LONDON.—For reconstructing in concrete part of river wall at Chancellor's Wharf, for Hammersmith Borough Council. Mr. H. Mair, Borough Surveyor, Town Hall, Broadway, Hammersmith:—

G. C. Webb & Co.	£1,211 19 3		
A. Fasey & Co.	945 1 6		
W. H. Williamson & Sons	933 0 0		
Muirhead, Greig, & Matthews ..	913 4 5		
W. H. Strickland & Co.....	884 7 8		
G. Wimpey & Co.	794 0 0		
A. T. Catley	793 0 0		
Case Sea Defence Syndicate, Ltd.*	770 15 2		

LONDON.—For converting two houses into shops, at 340 and 342, Barking-road, for Mr. W. Spitsled. Mr. Money Marsland, architect and surveyor, 68, Great Tower-street, E.C.:—

A. B. Hill	£390	W. J. Maddison*....	£365
A. Webb	379		

LONDON.—For the erection of new factory premises on the site of Nos. 45, 46, and 47, Clerkenwell-green, E.C., for Mr. A. J. Hollington. Mr. H. Yolland Boreham, architect, 73 and 75, Finsbury-pavement, E.C.:—

F. W. Harris.....	£6,429	W. H. Wagstaff & Sons	£5,442
Spiers & Son.....	6,145	Battley, Sons, & Holness	5,440
G. Barker	6,089	Sabey & Son.....	5,240
L. H. & R. Roberts	5,774	J. Chessum & Sons*	5,128
C. North	5,490		

NORTHWICH.—For sewerage works, Winnington-lane, for the Urban District Council. Mr. F. H. Bancroft, A.M.Inst.C.E., 88, Mosley-street, Manchester. Quantities by engineer:—

Etheridge & Clarke ..	£1,194 8 10	A. J. Cottle	£1,098 7 1
J. Dale	1,120 18 9	S. Hutton, Bowdon*	894 6 9
Sanders & Torrance .	1,031 19 9		

REDDITCH.—For erecting a brick chimney, 120 ft. high, at the Electricity Works, for the Urban District Council. Mr. Bernard Perrins, Surveyor, Redditch:—

Smith Bros.	£1,050	A. G. Avery.....	£883
Universal Engineering Co.	1,019	J. Roberts	866
G. Huins & Sons ..	999	G. E. Jackson	739
A. Nevins & Co...	980	G. Emery.....	666
Alphons Custodis Chimney Co.....	918	F. Newbould, Redditch*	649
P. Myles	902	T. Geomans	646

Steel Chimney.

Babcock & Wilcox	£1,076	E. White	£850
A. Nevins & Co. ..	975	Piggott & Co.	819

Boiler House.

F. Newbould	£666	A. G. Avery.....	£543
W. H. Eakins & Son	658	G. Huins & Son, Redditch*	500
T. Yeomans.....	545		

SHILDON (Durham).—For road works, East-parade, for the Shildon and East Thickley Urban District Council. Mr. C. Heslop, Surveyor. Quantities by Surveyor:—

W. Burdon	£189	Muggeridge & Coates, Shildon*	£158

[Estimated cost, £188.]

SENGHENITH.—For erecting shop, warehouse, and stable, for the Industrial Co-operative Society, Ltd. :—

Davies & Lloyd	£1,285 10	J. Williams, High-st., Aber*	£1,265 0
R. Jones	1,283 0	D. C. Jones	1,245 15

SLAITHWAITE.—For 350 tons of Penmaenmawr granite, for the Urban District Council :—

	Per ton. s. d.
J. N. Smith & Co. (Horton Granite)	10 9
T. Feather (Cliffe Hill Granite)	12 5
T. Feather (Hard Blue Rock)	8 4
R. Allen (granite as sample)	11 1
R. Allen (granite as sample)	11 4
J. J. Lee (Penmaenmawr Granite)	11 6
Brundrill & Co. (Penmaenmawr Granite 2½ in.)	11 9
Brundrill & Co., Liverpool (Penmaenmawr Granite, 2 in.)*	11 6
Brundrill & Co. (Penmaenmawr Granite ½ in.)	9 3
Ord & Maddison (Blue Granite)	11 10
Threlkeld Granite Co. (Threlkeld Granite)	10 8
G. A. Watson & Co. (Penmaenmawr Granite)	11 0
Darbishers, Ltd. (Penmaenmawr Granite)	11 0
Carlingford Granite Co., Ltd. (Syenite)	11 5

ST. ALBANS.—For the erection of a villa residence, Brampton-road, St. Albans, for Mr. F. Knox Furtado. Mr. S. Doddimeade Edmunds, architect and surveyor, St. Albans :—

E. Dunham	£478 0	Vail & Williamson‡	£307 10
Edmunds & Wright	375 0		

‡ Reduced and accepted.

TREDEGAR.—For erecting twenty-five houses at Park-hill, for the Chamber of Trade Building Club. Mr. W. Beddoes Rees, architect, 37, St. Mary-street, Cardiff :—

	Per house.
D. J. Vaughan, Tredegar	£305 0 0

WAKEFIELD.—For erecting branch store at Newmillerdam, for the Wakefield Industrial Society, Ltd. Mr. A. Hart, architect and surveyor, Bank-street, Wakefield. Quantities by the architect :—

Excavators, Masons, Bricklayers, and Steel Work : Marshall & Son, Chapelthorpe*	£267 17 7
Joiner : W. Noble, Wakefield*	170 0 0
Plumber : W. Gillott, Wakefield*	36 7 6
Slaters : Pukles Bros., Leeds*	21 5 0
Painters : Broadbent & Son, Wakefield*	8 14 0
	£504 4 1

Complete Work.

F. F. Salmon & Co.	£649 15 6	H. Waite	£550 0 0

WICKLOW.—For concrete foundations and other works in connexion with the erection of a new technical school on The Mall, for the Urban District Council. Mr. John Pansing, C.E., Town Surveyor, Wicklow :—

A. M. Gowan	£175 0 0
W. Rose, Fitzwilliam-square, Wicklow*	123 10 0

TOTTENHAM.—For making-up Broadwater, Elmhurst, Linley, and Wimborne roads, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham :—

	Broadwater-road. £ s. d.	Elmhurst-road. £ s. d.	Linley-road. £ s. d.	Wimborne-road. £ s. d.
E. Frost, Tottenham*	1,234 8 0	[355 2 2	754 0 0	535 10 7
Grounds & Newton	1,269 2 10	382 15 4	760 1 0	585 1 9
G. Porter	1,734 2 6	536 9 6	1,059 7 7	746 1 7
E. T. Bloomfield	1,328 7 3	[386 7 3	] 797 14 11	540 10 1
T. Rowley, jun.	1,361 12 0	407 9 5	828 11 10	—
T. Adams	1,441 8 4	441 7 2	893 18 6	638 1 0
C. Bloomfield	—	360 0 0	789 16 6	—

ST. ALBANS.—Accepted for the erection of a residence, Clarence-road, for Mrs. E. S. Edmunds. Mr. S. Doddimeade Edmunds, architect and surveyor, St. Albans :—

W. Goodchild & Sons	£560

ST. ALBANS.—For the erection of a residence, Clarence-road, St. Albans. Mr. S. Doddimeade Edmunds, architect and surveyor, St. Albans :—

Vail & Williamson	£740	Edmunds & Wright	£700

ST. ALBANS.—For the erection of a residence, Verulam-road, St. Albans, for Mr. J. E. Hayes. Mr. S. Doddimeade Edmunds, architect and surveyor, St. Albans. Quantities by the architect :—

Wibley & Jervis	£2,138 0	E. Dunham	£1,686 0
J. T. Bushell	1,970 0	C. W. Dumpleton	1,547 0
Miskin & Sons	1,744 0	Vail & Williamson	1,459 15
Goodchild & Jeffery	1,725 5		
W. Sharp	1,716 0		

ST. ALBANS.—For the erection of a house and shop, Catherine and Etna-street, St. Albans, for Mr. C. A. Sharpe. Mr. S. Doddimeade Edmunds, architect and surveyor, St. Albans. Quantities by the architect :—

Goodchild & Jeffrey	£838	Vail & Williamson, St. Albans*	£780

STOKE RIVERS (near Barnstaple).—For restoring and reseating the Parish Church. Mr. W. J. Tamlyn, architect, Minehead :—

J. Bryant & Son, Barnstaple*	£327

EMPIRE PALACE ALTERATIONS, PORTSMOUTH.—In our last issue, the name of the contractor who is carrying out this work was given as "F. Cake." It should have been "F. Corke." The mistake was not ours.

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